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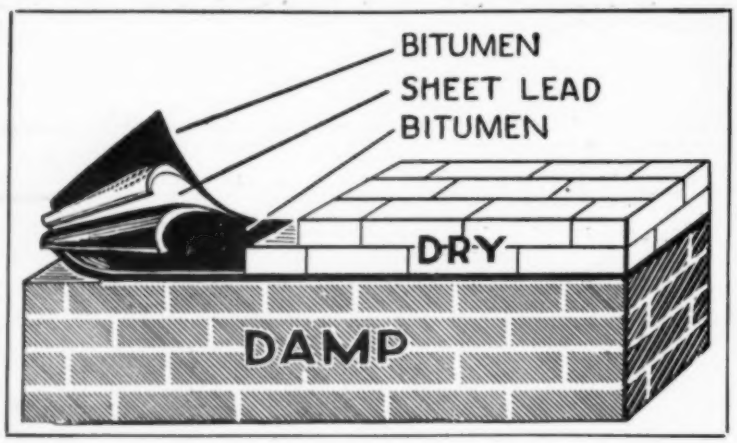

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THE BUILDER

A JOURNAL FOR THE ARCHITECT AND CONSTRUCTOR.

WITH WHICH IS INCORPORATED "THE BRITISH ARCHITECT."

VOL. CXXVI.—No. 4223. JANUARY 11, 1924.

STATE CRAFT AND BUILDING CRAFT.

ARCHITECTURE, as we know, is a flower that grows on the surface of civilisation. It is, perhaps, a by-product rather than a product. At the risk of being accused of calling it a weed instead of a garden plant, we might assure ourselves that its free growth is spontaneous rather than forced; that a fine civilisation gives off fine architecture not as the product of effort but as the inevitable and healthy result of activities which, in the main, are directed to other ends. After all, we recognise that there are in the world of natural beauty wild plants as beautiful as the trained; so let us call it a by-product, realising that wild or cultured—spontaneous or trained—the flower owes its life and its beauty to the soil.

And for architecture the soil is civilisation, the life of ordered society, the State. How strange is this reflection at a time like the present! How much more solid in those last days of 1923 seemed the purpose, the progress, and the performance of architecture than that vortex of upheaval which has been racking the bases of our State. These disturbances are, it may be, much more apparent than real. There may be—we believe there is—that in the unwritten constitution of England and in its traditions of government which rises above and is anchored beneath all battles of party against party. It is happier to believe in and to trust this hidden and majestic force than to analyse it, for there is in the minds of those who think deeply of such matters a lurking fear lest this hidden deity, if hunted home and revealed, should prove to be nothing more than the deeply reverenced law that under a competent chairman fifty-one men can rule the destinies of any hundred of which they form a part. The fact, of course, is that all civilisations are games played under fixed rules. We say "games" not as implying anything childish or frivolous, for there is nothing less frivolous or childish in this world than British cricket. The laws of any State—that is, the constitutional laws—which may be no more than unwritten customs, are the framework of that implied contract between citizen and citizen which—unless cancelled by revolution, makes the State a State. And even revolution, its object once achieved, has a tendency to build its new structure, if it builds at all, on the old foundations and around the old framework. These traditional bonds are the laws of the game to which as citizens, anxious to keep our country free from civil tumult, we owe, and rightly owe, the homage of patriots. This is why a strain on those rules however apparently ridiculous is indeed no laughing matter.

This is no political journal: we are not talking politics; we are merely gazing, as every man and every architect must gaze, on the unusual spectacle of an unusual fact. It is experiences such as this which make us wonder at the strange inadequacy of the constitutional machine and make us further, while wondering, admire. For indeed we can trust, for all our amazement, and in our trust we can realise that England's strange elastic strength is equal to every emergency. Sooner or later, probably very soon, the crisis of threefold division will resolve itself into the old accustomed fight of one against one—a fight which is all the friendlier because of its antiquity. England then will settle down to plainer issues.

Meanwhile, the great cranes swing the great blocks from street level to sky line, and architecture, crippled though she is by the astounding phenomenon of a grim shortage of men, which stalks through the land arm in arm with hideous unemployment, architecture, the ancient and sublime, goes on her majestic way. But she goes in fear; for if the State is crippled she falls. If the fair field of her growth is sterilised she fades.

How little people think on the nature of civilisation. The sound man broods little on the nature of health, and citizens in the sound commonwealth give little heed to the conditions out of which a commonwealth is built.

The wisest folk will often think and utter the strangest thoughts about the nature of social existence and social growth. For example, war—the strife between nation and nation—has been sometimes spoken of as a relapse into barbarism. War is a horrible and detestable thing; but the more horrible it is and the more detestable the less can we afford to overlook the undoubted fact that so far from its being a return to man's state before civilisation, it is in fact with all its vileness a product of a very high order of State culture. Personal attack by man against man, individual against individual, may be, it is true, a return to savagery, but war itself, unless manœuvred by irresponsible autocrats, is the action of a civilisation not indeed primitive, but so organised and developed that its citizens prefer to undergo the risk of the gravest personal injuries rather than jeopardise the State to which they owe a sacred allegiance. That war will be in the near future superseded in practical world politics by reasonable international arrangements for the settlement of disputes is the earnest wish and prayer of more thoughtful statesmen; but those who condemn it as an evidence of insufficient civilisation misunderstand not only the facts of history but the logic of State-growth.

But to return to architecture and the realm. Which is the more important to humanity, the art of architecture or the craft of State management? The latter, obviously, for without an ordered State an architectural life would be impossible. But how bewildering is the thought that the preparation for State control in our rulers is infinitely slighter than the pains bestowed on the training of a young architect; and how entirely absent in the case of England's controllers are the safeguards with which we preserve architecture from the danger of untrained practitioners. We need a Socrates who, by homely questions and trenchant answers, should reveal the absurdity of the actual condition.

It is sometimes said that the great safeguard of England's rule lies in the permanent officials of the government offices; in other words, that no matter who come and go as nominal rulers, their actions can only take effect through trained professional administrators. This line of comfort may perhaps be sound. An architect friend of ours once saw in this a parallel. Ministers of the Crown are, he said, in the same position towards statecraft as are clients towards architecture. Architects, he said, are set in motion by clients, persons who may or may not have architectural taste. It rests with the guardians of the art to see that client's orders never result in outrages against its canons. The parallel may be sound. Who knows?

With these thoughts we go forth into the New Year, if full of anxiety, at least full of hope, for without hope neither architecture nor statesmanship can succeed. And we trust that our readers, be they architects or voters, or both, will find in the coming twelve months the rewards of sound statesmanship and pure art; that the soil in which our craft alone can flourish may be well tilled and produce not only the flowers of architecture, but those still greater fruits, "peace and happiness, truth and justice, religion and piety."

NOTES.

R.S.A. Architectural President.

ANOTHER indication that architecture is coming more into its own may be found in the election of Mr. George Washington Browne to the Presidentship of the Royal Scottish Academy. Nobody can possibly wish to dethrone the art of painting pictures from its great position in the life of the world, for it has had a valuable interest as an educational refinement, but the function of architectural art so combines all other arts, both on the practical and artistic sides, that architects may be pardoned if they consider an architect as peculiarly fitted for such an office as president of a painting body. Mr. Washington Browne has long since won his spurs as a particularly able architect and he has outstanding merit as an artist. We congratulate him and also the Academy on his election.

Individuality.

WE often wonder how much or how little the average man realises the value of individuality. Yet it would be a terrible world if we were all cut out to an exact pattern, and if we consider it we shall find that it is less the nearness to perfection which we learn to regard in an individual than the little lapses from the perfect form, or action, or thought. We even come to like the individuality of a trick or halt in speech or movement. Therefore it would seem that individuality is a value in life which we all appreciate. And when we leave our own country we feel one of the outstanding interests is of other lands and peoples.* It is well, therefore, to remember that our British characteristics, which have grown into being through our climate, environment, and habits, have a definite value which it may not be wise to eliminate.

*In this issue we commence a series of articles by Mr. Theodore Fyfe on the value of travel.

Old Students' Royal College of Art Exhibition.

Garden Group, "Plenty."

By JESS L. PEACEY.

Old Students' Royal College of Art Exhibition.

Lead Garden Figure, "Mischief."

By ANNE ACHESON.

English Architecture.

THE above note leads us to some remarks on Major Corlette's admirable paper on "English Architecture," which he read before the Manchester Society of Architects—in which he dwells on the value of our national characteristics. As to how far it is well to try to alter our national character and mould it into an international type there may be varying opinions, but if variety is one of the undoubted charms of life it may be well to preserve as far as possible our national characteristics as well as those of a more specially individual character. There surely can be no two opinions as to what our average modern architecture is reflecting of any peculiarly British feeling; there is little enough to be found. Yet the development of Gothic art found a ready response amongst the British people, and beautiful and wonderful as French Gothic is at its best we all know that the specially British characteristics brought qualities to Gothic art which gave it a world-wide distinction. Now, since our national individuality seems to have found little or no expression since about Sir Christopher Wren's time, we have been floundering along midst copyism and revival until we have reached all sorts of modern eclecticism which is practically devoid of any national individuality. When order and character have evolved out of the present chaos will it show our well-defined English characteristics?

English Character.

WHAT is English architecture? We are glad that Major Corlette took English architecture as the subject of his address, and we hope what he had to say will bear some fruit. After our fifty years' trial in this country to infuse fresh interest in our modern work by revivals of every known style, both English and foreign, we have been settled down for a time into a general adoption of a muddled sort of Renaissance which is perhaps as little English as it can well be. We quote the following from Major Corlette:—"The Italian revival in Italy was a revival of a native and a Latin tradition. The introduction first of Italian detail and decoration and then of Italian, and, later, of Greek, form as well as detail into England and other northern countries was not revival. It was not a return to but it was a destruction of, and a break from, English tradition. And however much we may have learnt, and may still learn, from the many beauties of detail and of form Italian work possesses, it will never become a truly national tradition acceptable to and welcomed by a Gothic race. It does not appeal to their native instincts or to their inborn feeling. It is a culture, a southern plant in a northern soil. And it will never really thrive without a large variation and free handling that may make it conform to native ideas and national needs."

Oneself.

WE would appeal to all our architectural students who really love their art to be true to their instincts and seek to do what they can find pleasure in the doing. We do not for a moment suggest they should ignore the value of study and comparison; it is possible that the more they know about the world-wide refinements of architectural art the better equipped they will be, but they should refuse to be entangled in the meshes of an art that may be dead to them, but follow that admirable advice to be true to themselves. Our architecture cannot be good unless we understand the values of sound construction, fine proportion, and beautiful detail, and these may be obtained in any school and any style, but the vital matter lies in the designer who, because he has something in him worthy of expression, refuses merely to follow the lead of others, whether they be school or university professors or anyone who can pose or talk of art out of a dull and uninspiring mind.

Fellowship.

WE all realise the value of the advice, "Man, know thyself," though we may much doubt whether the average man often achieves that knowledge. But do we realise as we ought the value of knowing our fellows? We have often thought that the "At Homes" at the Institute might have led to a further development of this excellent social function. If the bulk of the pleasant talk which architects had with each other on these occasions was less of architecture than anything else, was not a more happy feeling of fellowship promoted, and did it not help the realisation that even a fellow-

DETAIL OF CARVING.
Cambridge University: School of Bio-Chemisty.
SIR EDWIN COOPER, F.R.I.B.A., Architect.
(*See p.* 52.)

competitor in the realms of art might be a very good fellow and help to lighten a little the dark shadows that cross our lives and professions. We had an intimate talk with a young architect the other day which seemed to us to throw a flood of daylight about things which interested him most, such as the eternal competition question and the grotesque distribution of honours, and the varying degrees of efficiency amongst fellow architects—nice, straight talk with no obscurity of views.

The Disfigurement of London Buildings.

IN reference to the letter which appeared on this subject in our issue of January 4, we have obtained the views of one or two well-known architects on the matter. Professor A. E. Richardson said that Mr. Belcher's Institute of Chartered Accountants was one of the most interesting examples of pre-war buildings in the City, and had the merit of expressing its character as an Institute. It seemed pitiful that the work of an artist should be disfigured by impertinent additions, which might remedy smoky chimneys, but spoiled the silhouette. People were very sensitive on these matters, and again their first impression of a building was from the skyline. There were other ways of curing a smoky chimney than by adopting cowls and tall-boys. Modern practice in the City aimed at the abolition of numbers of flues and the installation of a system of central heating; and it was to be hoped that the future would see a lessening of the number of chimney-pots. Finally, why not consult the architect?

Tidying up London.

ANOTHER architect expressed the view that the disfigurement of buildings was not confined to London alone. In fact, in Italy they had a saying that no one looked beyond the cornice line, because on the tops of beautiful palaces they had tanks, pipes and all sorts of excrescences. Unfortunately the particular disfigurement of the Institute of Chartered Accountants was not the only form of disfigurement that spoiled London buildings. At Aldwych, looking towards Bush House, there was a glaring disfigurement in the form of an electric light standard. Taking a wider view, the misplacement of call boxes, sand-bins, and the erection of kiosks all had their deleterious effect. He suggested that there should be a competition for students in order to find out the best method of tidying up London. It would be a better training than working at monuments and palaces which had not the slightest chance of erection. It would enable them to handle the small, practical things with which architects had to deal.

The Jury System.

Is the system of arriving at a decision in a competition by allotting marks for certain qualities a sound one? In any case, when it comes to allotting marks for draughtsmanship the system gets out of hand. What draughtsmanship has to do with the award we fail to see, except that an architect who will not, or cannot, make a good representation of his design might, with certain assessors, lose some sympathetic consideration. The arguments which may be advanced on the various aspects of competitions seem endless. On the face of it we might fairly claim that the competitors themselves are the best judges and probably the really able competitors are, but in a contest where a hundred or more take part it is doubtful whether the majority would take a sound view.

Developments in Builders' Plant.

ON another page we print the first of a series of articles under the general title of "Modern Builders' Machinery." These articles have been specially written for *The Builder*, their object being to discuss the great developments that have taken place in the plant available for the very varied requirements of the builder and contractor, and the results that are to be obtained by the use of it if judiciously selected and properly handled. The subject is of peculiar interest at the present day because, owing to the severe and protracted restrictions imposed on the building industry by the post-war policy of the Government, it is only now that that industry may be said to be able to revert to what we hope will be normal conditions. Hitherto, that is to say since 1914, there has been but little incentive or opportunity for the builder to give close attention to the advances made in this direction. In the frenzied construction that took place during the war, he

Mural Decoration, Mortuary Chapel, St. Alban's, Holborn.
By MR. C. W. WHALL. (*See p.* 44.)

Old Students' Royal College of Art Exhibition.

Silver Statuette, "Bhanavar."

By ALEXANDER FISHER.

could take only what he could get in the way of equipment, and since then and until recently it has been difficult for him to formulate a future policy of working, as he could not estimate with accuracy what was likely to be the permanent position of his industry or of himself.

Developments in Builders' Machinery.

DURING those ten years of abnormality the developments in builders' machinery have been very considerable, and it is our purpose to go fully into this question in these articles. There is a great deal of machinery available to-day which had not been dreamed of in the philosophy of the trade twenty, fifteen, and even ten years ago; and the whole routine of saw and cutter maintenance has been revolutionised. Thus, the big builder may more than double the output of his sawing and multiply that of his planing machines by four or five, as compared with pre-war practice, and without increasing his labour. He may virtually eliminate the hand-finishing of his woodwork, whether it is a question of scraping, sandpapering or polishing. He may plane his flooring after it is laid in position with as little effort, and as rapidly, as a gardener can mow a lawn; and he may even establish a sawmill inside a big building under construction and shift it from floor to floor as the work progresses with but little cost or inconvenience. While the man in a small way may not be able to avail himself of all the above advantages, he is proportionately a greater beneficiary under the modern developments than the larger builder. The machines now available for him have been greatly improved and, above all, simplified, and the advent of the electrical drive has widened his horizon immensely. This has rendered it possible for the builder of very small means to invoke the aid of machinery long before he would have been able to think of it when faced with the initial necessity of purchasing an engine, boiler and shafting, and of finding the labour, fuel and space for working them. All these and many other matters will be dealt with in this series of articles, and we invite those of our readers who are interested in this important subject to give their views and to raise any points on which they may desire either information or advice. Such communications should take the form of "Letters to the Editor," either for publication or not at his discretion.

Waterloo Bridge.

IT is rather wide of the mark to say that "the only person to bethink himself of Waterloo Bridge appears to have been Mr. H. V. Lanchester," for a good deal of thought has been bestowed upon it by others, and suggestions for duplicating have been made. But Mr. Lanchester's plan for a twin bridge crossing the river in an axial line from the west end of St. Clement Danes to the junction of Stamford-street and Cornwall-road has points in its favour, both for convenience and appearance, and would for a time lessen one of our worst congestions of traffic. It surely is about time that the whole problem of cross-river traffic was seriously taken in hand. Piece-meal work, however good, is not a substitute for the broader issues. Mr. Lanchester's admirable drawings of the bridge in *Architecture* must lead to some pertinent and active consideration.

A Christmas Card.

THE Christmas Card is still with us, and one can hardly doubt its value as an easy and pleasant means of expressing one's kindly remembrance to each other, whilst it has provided an outlet for a good deal of genuine artistic skill and a somewhat valuable industry. The bulk of designs are poor enough, but many are quite delightful and admirably produced. We have designs of an architectural character published from time to time, and the newly-created home often makes a pleasant and appropriate subject of special interest. Of this kind we publish an example to-day of the recently completed Gatehouse for Mr. Reginald Hanbury, which performs the double function of a lodge and a guesthouse, making a picturesque roadside feature.

An Architectural Christmas Card, 1923: The Gatehouse, Foxbury, Woldingham.

PROBLEMS OF 1924.

It is impossible to deal with the prospects before the building industry for the coming year without touching on political issues, and we, therefore, intend to examine impartially the probable trend of events in so far as they may affect building. The building industry, as a whole, is obviously dependent upon the state of trade, and this in turn, is based upon confidence at home and abroad. No Government can fail to address itself first and foremost to the problem of a general European settlement, and if this could be found we should enter into a period of expanding activity that would quickly influence every industry, including our own. Lack of confidence is holding up a vast amount of work that would be released the moment stable conditions in Europe were secured, and from the pronouncements of responsible leaders we believe that the foreign policy of the new Government, whatever complexion it may be, will be wise and constructive, while the suggested personnel of the Reparations Commission in itself justifies hope.

If there is already, from various causes, a greater sense of confidence in respect to European affairs, there is undoubtedly a lack of faith at home, although trade normally is looking up and unemployment slowly decreasing. Nervousness concerning affairs at home is indicated by the fall of the pound sterling, a general interruption of new industrial enterprise, and the holding over of factory building. While the threats of the more irresponsible among Labour extremists are undoubtedly to blame for this minor panic, yet we consider that even more disastrous is the unpatriotic and foolish attitude of those reactionaries who gleefully regard the experiment of a Labour Government as a means of providing so much rope wherewith Labour may hang itself. We hope, and believe, that a Labour Government not only would refrain from hanging itself, but would on the contrary welcome the opportunity of proving that it was not a "class" Government but one dependent, as every Government must be, on the suffrage, goodwill, and confidence of the people as a whole. With Socialism, in so far as it implies State ownership and control, we have little in common, but that the wider social spirit which places public interest before private advantage will be stimulated by the present change we think probable, if not certain. The stumbling block will be finance, and the future danger the promise of tantalising legislation to catch votes.

The particular "Labour Government" with which we may now be confronted must, of course, be dependent upon outside co-operation in the House itself, and it will, therefore, be unable to carry through legislation of a contentious character; we are, therefore, not likely to find a further definite attempt at State housing; indeed, it is not probable that, were a Labour Government in full power, it would attempt a housing programme without making every endeavour to secure the active and willing participation of the house builder. The operation of the Housing Act of 1923 will almost certainly be extended, but with, it is to be hoped, important statutory limitations as to the density of houses eligible for the subsidy.

A Labour Government would start with the initial advantage that it would not be regarded with suspicion by the trade unions, and, consequently, it should be able to arrive at some satisfactory arrangement as to dilution, one that will remove the very real dread of future unemployment. Mr. Kirkwood has already definitely ranged himself on the side of dilution, and this, with an increase in skilled labour and a proper system of apprenticeship, are necessities. There are two aspects to the housing problem: that of housing the population generally, and that of slum clearance. As to the latter there can be no disputing that private enterprise is unable to cope with it, and we hope that our next Government, by wise and fearless handling, will succeed in substituting useful reconstructive work for the distribution of immense sums in doles, which are universally admitted to be both degrading and demoralising. We have continually emphasised the wickedness and waste involved in spending vast sums of money on building hospitals, asylums, and prisons to deal with the wreckage resulting from our failure to deal with slums.

The new Government might well interest itself in securing the country against a repetition of the erection of dark houses. This can only be done by amending the Public Health Act of 1875 and insisting upon the provision of adequate light to each room used for human habitation. It is not too much to say that had light been included as well as air in that Act, and had the provision of this necessity been enforced, our towns would be almost unrecognisable to-day, and the tables of diseases would have been materially lower for the past forty years. It would be the blindest folly for Conservative extremists to resist such an amendment, since it is the fear that private enterprise might revert to building the dark house that spurs so many to reject private enterprise altogether.

Granting a general stability, we ought this year to see a real increase in the provision of the "middle-class" house at an economic rent, but the "working-class" house is still bound to be dependent upon either a subsidy or a measure of philanthropy or both. A certain resentment is naturally engendered by the word "philanthropy," but this need, in fact, be no more than a recognition by the individual that he owes a duty to the community, and even the problem of the working-class house could be largely solved locally by the formation of public utility societies among people really interested who would be prepared to make some sacrifice to see unsatisfactory local conditions remedied. The sacrifice might take the form of giving land at a low price, of giving time or advice gratis, or of lending money at a low rate of interest. Such a demonstration of public conscience, if sufficiently widespread, might well remove the apparent necessity for direct State interference in a business which the State is not really capable of carrying out cheaply and efficiently, and would mean an immense saving to the national exchequer. But Labour itself must recognise that every citizen owes a duty as well as possesses "rights"; and the tendency of the local demagogue to snub or cold-shoulder the efforts of others on his behalf will, we hope, be discouraged by Labour leaders at headquarters.

One of the factors that has arrested building is the fear that at any moment labour and materials may be artificially diverted from so-called luxury building, and a further source of trouble is the constant interference by trade unions who attempt to dictate as to whose job it is to do this or that regardless of who, in fact, is capable of doing it; such an attitude embodies the negation of progress and reflects the "caste work" system of the Indian compound. Whereas the attitude towards luxury building is an affair of Labour policy generally, the personal interference is, as a rule, the result of small local tyrannies which must be seriously checked from headquarters if real labour grievances are to hold public sympathy.

It is to be hoped that during the coming year co-operation between architect and builder in small house design will be extended, and that a high standard generally will be maintained. Private enterprise is on trial, and if it should fail to justify itself by not producing the best work, even though it produces the greatest quantity, it will, without doubt, eventually go by the board. One can assert with confidence that we are unlikely to witness any lowering of standard in local authorities' schemes, and it will be in comparison with these that the results of private enterprise will be judged. While we have no fears of the work being carried out by the more enthusiastic members of the National Federation of House Builders, we, as champions of private enterprise, fully realise that it is by its least efficient result that the principle will be judged, and the National Federation will, we are sure, not fail to realise this.

In respect to larger houses, the servant shortage and the consequent necessity for eliminating unnecessary labour will continue to act as a stimulus to economical planning, and the extra trouble that this entails will be visible in the greater care bestowed upon the elevations. This factor, together with the ever present necessity for strict economy, will keep house design along the straight road of direct self-expression and will further wean the public taste from the unwholesome condiments of 20 years ago. It is fairly certain that house design, taken as a whole, will consolidate the gains it has secured during the past three years. Nor is architecture likely to be the only art to make a distinct advance; indeed, a curious result of the turn of the political wheel will almost certainly be seen in the greater State encouragement that will be given to all the arts, since the arts have in the past been available only to the rich, and labour cannot fail to do its utmost to democratise them. Such a change can only be beneficial, provided that it contents itself with interpreting the more enlightened public opinion. Up to the present, this country has taken a mild pride in the fact that the Government has been less than almost any other in fostering the arts or even recognising them in any shape or form.

It is significant that many of the most far-reaching Acts of Parliament have found their way to the Statute Book during the tenure of office of Coalition Governments, when Bills must be as non-contentious as possible. As proof of this, we have only to cite Women's Franchise, Daylight Saving, and the Irish Treaty. Now, whatever Government may be in power, we are certainly going to have a Coalition Parliament, however much the word may be avoided. It is not hard to find a measure that public feeling would welcome from almost every quarter, and that would indirectly profoundly affect both the erection and the life of our buildings; we refer to a Bill to deal seriously and comprehensively with the whole question of smoke and air pollution. The spade work has been done by the Departmental Committee on Smoke and Noxious Vapours Abatement appointed in 1920, and ample evidence has been collected elsewhere. An Act such as this would mark a step in the progress of our civilisation that would be remembered for generations longer than any of the more vote-catching party measures.

The coming year will be the first in which town-planning schemes will really seriously affect considerations of building, and those districts concerned will be the pioneers leading the way to a system that in twenty years' time should be almost universal. In regard to the movement towards higher buildings, the arguments adduced against any serious change seem to outweigh the considerations in their favour, at least in so far as the good of the public is concerned. The increasing attention devoted to architecture in the columns of the Press and elsewhere reflect a growing public interest and appreciation; a welcome sign being the disappearance of tens of thousands of monstrous signs that for years past have blighted our towns and country villages.

We cannot do better as a New Year's resolution than determine to take an active part in stimulating a public indignation against those evils with which we are surrounded, and thus get them set right by the only agency that can effect a permanent cure.

London Omnibus Garages.

On January 9 the L.G.O.C. will open up two new garages at Barking and Sutton, providing accommodation for over 200 'buses. The garages are part of the big development scheme which the Underground have for developing their motor-bus undertakings, and have been erected at a cost of £63,000. Garages are now being erected at Bromley, Romford, and Sidcup.

GENERAL NEWS.

Professional Announcements.

Mr. Sidney Toy, A.R.I.B.A., has removed his offices to 1, Cloisters, Temple, E.C.

After December 28, the address of Mr. Evelyn Hellicar, A.R.I.B.A., will be 43, Bedford-row, W.C.1. Telephone No. : Chancery 7093.

The business partnership hitherto carried on in the name of Kennard & Kennard will cease to exist on and after January 31. From that date the partners will practise independently. Mr. J. H. Kennard, F.R.I.B.A., at No. 12, Gray's Inn-square, London, W.C.1, and Mr. Laurence Kennard, F.S.I., at No. 31, John-street, Bedford-row, London, W.C.1.

Fire.

On January 7 one of the largest fires that has occurred for some time in London broke out at Concordia Wharf, Managers-street, Coldharbour. Damage was caused to the extent of about £200,000.

Hampton Court Bridge.

The Surrey County Council reported that the County Surveyors of Surrey and Middlesex had been instructed to make a joint report as to the possibility, and the cost, of adapting Hampton Court bridge to meet the requirements of modern traffic, and also as to the desirability and the cost of a new bridge and the necessary approaches.

North Wales University Science Buildings, Bangor.

We understand from Mr. Alan Munby, F.R.I.B.A., that the announcement made some weeks ago in the public press as to the contractors for the above work now requires correction. The tenders were submitted to the North Wales Heroes Memorial Council when the lowest, that of Messrs. Trollope & Colls, was accepted by formal resolution as was reported, but before formalities could be completed Messrs. Trollope & Colls withdrew, and the work has now been placed in the hands of Messrs. John Laing & Sons, of Carlisle.

Strand Widening.

In connection with the Strand widening scheme, the part of the works which incidentally involves the widening of the Wellington-street approach to Waterloo Bridge, has been commenced. The block of shops at the corner of Wellington-street and extending along the Strand to Savoy-street, is being demolished. The Strand frontage will therefore be put back to the Savoy building line, and the Wellington-street frontage to a line with Lancaster-place—the block of buildings at the bridge end of Wellington-street. Lancaster-place stands on ground belonging to the Duchy of Lancaster, and the offices of the Duchy are still there.

Cartoon Study for West Window for the Church of the Good Shepherd, Leeds. By MR. REGINALD HALLWARD.

COLLEGE OF ART STUDENTS' WORK.

THERE ought to be a large attendance at the exhibition of work by old students of the College of Art. The proportion of good work is so large, compared with ordinary exhibitions, that a good deal of pleasure may be found in it. The fact that much of this work may have been seen before does not detract from the value of it, for it is well that we should obtain a retrospective glance and see whether we have advanced quite so nicely as we think. There are, however, works included which have been only recently done. It would take much time and space to do justice to such an excellent exhibition, and, good as it is, it might possibly have been much larger. The water-colour section is especially interesting, and sculpture is also well represented. An admirable collection of etchings and drawings include such things as the exquisite "Morning Haze," by Sir Frank Short, an admirable etching of St. Etienne by Walter M. Keesey, a beautiful plate of "College-street, York," by A. Michael Fletcher, and the "Street of the Forgotten Name," by Fred Richards. A commentary on Fame is afforded by a reference to the silent ones in the Foreword. This says: "Of the great silent army of designers and art workers who have been trained at South Kensington the world hears nothing. They are, so far as the public is concerned, the nameless ones. After having left the College what became of them, where they went, in what factories or offices they were employed, has been almost impossible to discover. Yet their works are more widely displayed than those of any other section of artists. For they, in the design of furniture, textiles, embroideries, pottery, glass, and kindred works, beautify the homes of England, and the near and far-flung countries of the Empire. But here in this Exhibition they are scantily represented for the reasons given above." The exhibition remains open until January 26.

MEETINGS.

FRIDAY, *January* 11.

London Society.—Sir T. Chambers on "Satellite Towns." 18, John-street, W.C. 2. 5 p.m.

MONDAY, *January* 14.

Architectural Association.—Lecture by Professor A. E. Richardson. 7 p.m.

National Association of Master Plasterers.—Dinner. Holborn Restaurant, W.C. 1. 6.30 p.m.

TUESDAY, *January* 15.

Electrical Contractors' Association.—Dinner. At Hotel Cecil. 6.30 p.m.

WEDNESDAY, *January* 16.

L.C.C. Central School of Arts and Crafts.—Sir Banister Fletcher on "Roman Architecture." 6 p.m.

Institute of British Decorators.—Mr. W. W. Davidson on "Stencils and Their Use." At Leeds. 7.30 p.m.

THURSDAY, *January* 17.

Society of Antiquaries.—Mr. C. L. Kingsford, on "A London Merchant's House and Its Owners." At Burlington House, W. 1.

Edinburgh Architectural Association.—Professor Hughes on "The Grand Manner in Architecture." At 15, Rutland-square. 8 p.m.

Institution of Electrical Engineers.—Mr. H. Marryat on "Electric Passenger Lifts." 6 p.m.

COMPETITION NEWS

Cairo.

The conditions of the Cairo Law Courts Competition are not in accordance with the regulations of the R.I.B.A., and Members are advised not to take part in it.

Other Competitions.

For other competitions still open, see our last issue.

CORRESPONDENCE.

Menai Suspension Bridge.

SIR,—Are not the two County Councils concerned too precipitate in adopting the Government's proposal to replace Telford's graceful structure by a ferro-concrete bridge, subject only to a prior examination of its design?

We know the weakness of Telford's bridge in respect of:—

(1) Insufficient consideration of wind pressure.

(2) Localisation of weight of traffic.

(3) Consequent crystallisation.

All of which can be removed by:—

(1) Light lattice girders distributing the weight on to many, instead of, as now, on to but a few of the suspension rods.

(2) By a system of cross diagonal bracing in, or under, the floor, and to the chains.

(3) By annealing.

I suggest that accurate drawings of the present bridge, together with a report of its condition and statement of the new requirements, be prepared, from which tenders for a conservative strengthening be obtained before, if at all, proceeding with the Government's drastic proposal.

Objects of beauty are too little considered.

Might not both Councils unite to stop that vandalism, the destruction of Penmaenmawr Mountain?

Had not our principal of fifty years ago intervened the beautiful oak roof of Conway Church would have been destroyed and been replaced by an acutely pointed one of common deal.

Manchester. A. H. STOTT.

R.I.B.A. (Alfred Bossom) Travelling Studentship.

SIR,—With reference to the notice headed "R.I.B.A." on page 4 of your issue for January 4, 1924, I shall be glad if you will make it clear in your next issue that admission to the competition for the Studentship is not confined to those students of the Recognised Schools of Architecture which enjoy exemption from the R.I.B.A. Final Examination, who, after passing through the School courses, have attained the Associateship of the R.I.B.A. In addition to those students, Associates R.I.B.A. who have attended certain other schools admitted to the competition by the Board of Architectural Education, and Associates who have obtained their Associateship without attending any School of Architecture, will be eligible for admission to the competition.

May I draw your attention to the fact that the correct titles for the Studentship and Scholarships mentioned in the same paragraph are "The R.I.B.A. (Alfred Bossom) Travelling Studentship," and "The R.I.B.A. (Archibald Dawnay) Scholarships?"

EVERARD J. HAYNES,
Secretary to the Board.

"The Disfigurement of Buildings."

SIR,—The interesting picture illustrating the letter of Mr. E. O. Parsons fairly well depicts what we see every day on the building skyline in our large cities and towns. The poor, harmless chimney might have been kept out of the landscape. It must surely have been built before the days of radiators or hot air, and have tormented some poor thin-blooded clerk person, or perhaps smoked him out, and been crowned for its sins with a zinc or metal "lum" or cowl, put on to save it from the savage and no doubt righteously angry swoop of wind from the brows of the indignant cupola. However, there is a point I would like to refer to about high and large buildings in narrow streets. Do architects or building committees ever consider for one single moment that the placing of towers, minarets and huge masses of sculptured stone above the line of projecting cornice and in beyond the façade of the building is a waste of time, money and talent, and that the average passer-by seldom ever notes them any more than he does the atrocious chimney pots, things of utility which may once in a while raise the bile of the idealist? What about other atrocities which mar our streets—sky signs, structural ironwork, shop fronts apparently resting on sheet glass and a few bricks, with huge masses ornate but sometimes—mostly sometimes—otherwise, of stone, marble, &c., all massed indiscriminately together, false in design and taste?

The only word that I, as a reader, can coin for such a spirit is "Bungleism," or ignorant toleration. Some of our business men need to be awakened up and told bluntly by the profession that such things can't be done as they are a crime and a sin, because they are vicious and false in principle. Just as a minister or clergyman can condemn a lie for what it is, so should our leaders in architectural thought condemn it. J. H. EDWARDS.

Carbon Study for West Window for the Church of the Good Shepherd, Leeds.
By MR. REGINALD HALLWARD.

Architects' and Builders' Inquiry Bureau.

For "The Architects' and Builders' Inquiry Bureau," see p. 70.

Charlatans and Pests.

SIR,—The letter in your issue of December 28, 1923, is so irrational that I don't dare to assume that the writer is a mere man. I have glanced through the correspondence and gather that it was directed against charlatans, or "quacks" and pests, i.e., "anything destructive or troublesome." Ladies "who have designed houses for themselves all over the country" cannot be described as quacks *if* they designed them, though I daresay that the architects they commissioned "just to put their ideas into shape" (a phrase most of us have frequently been tortured by) might possibly have found them troublesome.

The objectionable quack is the man devoid of architectural training, and so ineligible for membership in any Architectural Society, who poses as an architect, charges fees for his faulty designs or for designs that he has misappropriated and imposes on an unsuspicious public. That he is also a pest goes without saying.

It is a trite truism to say that some doctors are better than others; the point is that no doctor is allowed to experiment on patients until he has at least been taught his job.

With architecture this is not so, and the qualified man is bound to a standard of practice which the uneducated pirate ignores—except as a means of obtaining payment for his inadequate services. In this way the man who tacks "architect" to his other business descriptions becomes both troublesome and destructive.

Why should these quacks and pests be allowed to murder imaginative art and offend taste at every turn with their horrid experiments? Not only men, but many women, are toiling away to graduate in a difficult profession and I venture to say that our lady architects will be equally vehement with the men in the war on quacks and pests. "INSECTICIDE."

PRINCIPLES OF MURAL PAINTING AND STAINED GLASS.

BY REGINALD HALLWARD.

ONE era succeeds to another. The ideals of one time have their period and pass, to make way for the new time which has superseded them. The emphasis changes its place, and what was first is no longer so. The difficulty always in understanding art is that so little can be taught. It is useless to gird at the commercialising of it under industrialism while we have so little understanding of its nature, and the record of three windows a week, attributed to a well-known firm of glass window manufacturers, suggests nothing to us. And it is much the same in regard to mural painting. Here and there the genuine impulse is seen quietly finding expression amid alien influences, quite contradicting all the sentimental talk about "encouragement of art," which ever finds its truest encouragement in the artist's own fidelity of outlook and practise. The mural painting (illustrated here), by Mr. C. W. Whall, every touch of which was executed *in situ*, shows the good work done by an artist, not through any theories about art, but by the right practise of it. This mural painting occupies a space of the chapel wall in St. Alban's, Holborn, and the circumstances were such as illustrate the necessity of working under the conditions in which the work is to be seen, which compel the treatment. The chapel being very dark, it was necessary to use colour adequate to the situation, so, to get the effect of the pale green sky of dawn, the artist had to use pure emerald green. In reference to this Mr. Whall tells me, "When I took the palette I had been using all day out into the daylight to clean it, it was enough to frighten anyone; impossible to have used it in a studio." This is all so obvious that it hardly seems credible that a studio substitute for this direct method should so often prevail instead. The clergyman at the time supposed, so the artist tells me, that he would pay a visit to the chapel during the progress of the work, and was quite surprised when told that he intended to paint the thing himself. How often has my own public work brought the same experience. It seems to some so much more gentlemanly to get it done by assistants, while the employer looks in once or twice in black coat and seals, "watching it go." The artist is primarily a worker, not an employer, a craftsman, not a director, and our values derived from the counting house lead us astray. That in certain of our art schools there should be a training in mural painting going on to-day, with opportunities sought for public work for the students engaged in it, work done in the wrong way in execrable materials, executed away from the actual site and under none of the conditions rightly governing such work, should do something towards converting us to the belief—and I think we are being converted to it—that art is best encouraged through the artist, and that the long-continued "encouragement of art" encourages everything else but art.

In spite of the spread of education in craft methods, we find that little of art can be taught; that it is, after all, largely a personal matter, and not to be encouraged much in this way. It is true that the craftsman is paid and the artist is not. The latter gives his art because there is no price for it. Let him who would be an artist dare this delight for its own sake. It cannot be charged upon the public, but is a charge laid on himself, and this no craft training will teach. An age of knowledge, which the sophist tells us has superseded that of faith, cannot give us art which is born of the latter and gives for the sake of giving.

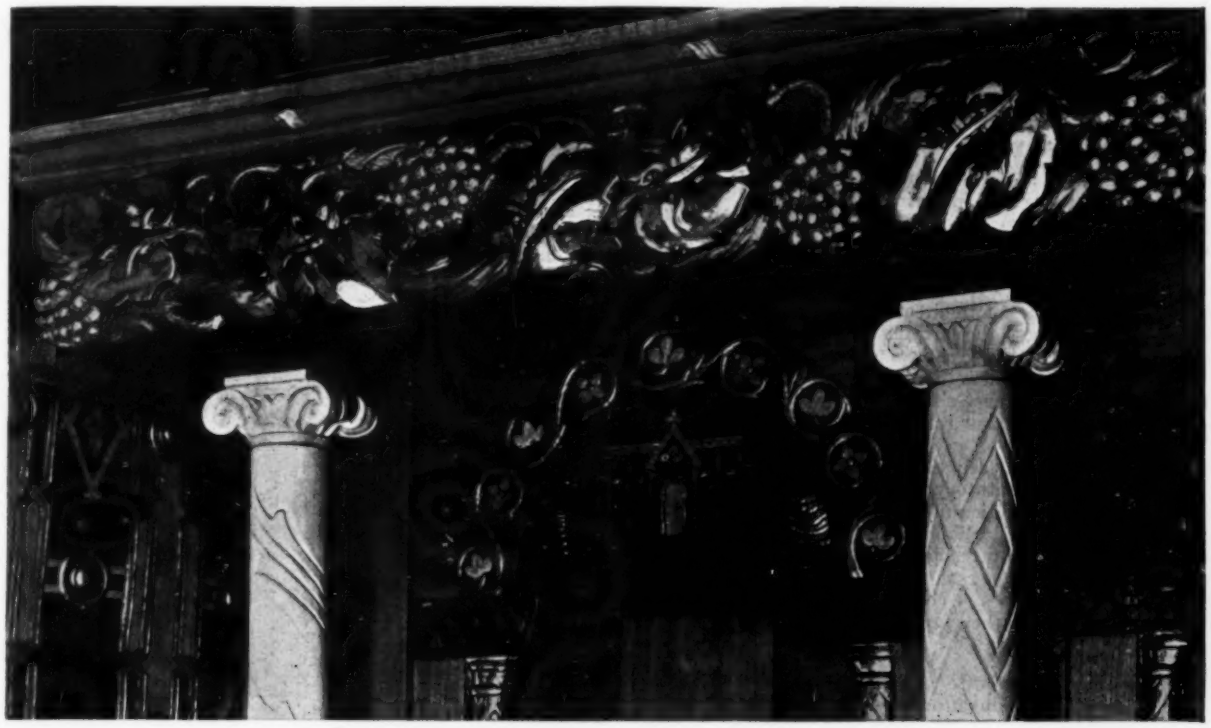
A comment rather characteristic of our time was made by an artist when shown some pictures in the house of a collector, who, after admiring the canvasses, said, "But he could not live on work of this kind; I suppose he had a private income"—reminding one of that reply of the bishop when approached by a young clergyman who wanted to take up special work: "Well, have you the money for it," said the bishop, "the money will be the evidence of the call." This view that vocation cannot exercise itself without the security of private income is surprising, for not many artists are called by this reasoning. And yet it is difficult to believe that vocation and endowment hold no other security than that of money. Either there is some call higher than all this, or there is no place for the arts, for it is never worldly prosperity that most endows them. Inspiration does not seem to come that way. It is worth thinking over for all of us—worth deciding upon—for I have seen failure enough through lack of such decision. If we are but the creatures of circumstance, pawns of the counting house, and man is not master of his fate, what is the use if our heads are "bloody" as well as "bowed?" Better spend our empty days on nothing so we are paid for it. But how absurd even the statement of it sounds, containing as it does its own refutation, denying all the best achievement of all the noblest people, all the best things ever done in the world; perhaps all the things worth doing at all! I was set thinking of this by all the encouragement of art, industrial and other, that surrounds us now—encouragement of art with the best artists half employed—and I wondered when this sort of security for art on which we set so much store, to the immense insecurity of the artist himself, has passed away, whether it will not be the best day for the arts they have known for a very long while.

The constant danger is lest the talker rather than the doer become uppermost, and we get drawn into false estimations of value, such as the world endows, instead of the freer and larger outlook of the artist, which bureaucracy fears and would crush. If we mistake one for the other it bodes ill for art, which is by its nature and the compulsion of its work withdrawn from all the platform and official attitudinising, which obscures it so much. When I notice how much those who are not artists speak for art, I wonder how the public, except through its own better knowledge, can distinguish its right hand from its left in such matters. The people are none the less more capable of appreciating true values, as I have seen over and over again in the practise of my work, and it is not them but the intermediaries who intervene to darken knowledge and misdirect appreciation.

Reredos at Hillingdon Church. By Mr. JOHN D. BATTEN.

The reredos for Hillingdon Church, by Mr. John D. Batten (illustrated in this issue) is an interesting and beautiful example of one of our most scholarly and sincere artists, who has brought to his methods a knowledge and research of exceptional value and importance to the practise of art. This reredos, built mainly of walnut, occupies in elevation exactly the same space as the previous dossal, and stands wholly on the stone sill of the window, which is 15 in. deep.

The conspicuous features are a vine carved canopy, gilded and burnished, supported on four sycamore pillars with gilded caps in the spaces, behind which are three recesses, the arched tops of which are supported on smaller gilded pillars. The three lunettes are decorated with shallow carving enriched



Reredos at Hillingdon Church. By MR. JOHN D. BATTEN.

with foil, lacquer and colour, but they only tell dimly in the dusk below the gilded canopy. The vine carving was done from Mr. Batten's design, very beautifully, by William Wheeler, and I am glad to give some record of his work in the photograph reproduced. The gilding was done by Mrs. Batten, who has mastered the craft by a reverent obedience to the directions of Cennino Cennini, and it would not be too much to say that the gilding is up to the level of the finest work of the Quattrocento.

After the reredos was in place it was felt that the light from the east window on each side of the reredos was still distressing to a congregation looking towards the east, and Mr. Batten designed curtains to screen the lower portion of them. It occurred to him that leather would be a suitable material, as it would not collect and hold dust. We are familiar with the achievement of the Spanish leather hangings, but the artist kept purposely at a great distance from the Spanish design, though using pretty much the same means of embossing, colouring and lacquering. There is, however, an important difference in technique. The Spanish metal that shows like gold is always silver foil covered with a yellow lacquer, and the artist had intended to use this method, but the yellow lacquer faded when superimposed, and he had no time for such research as could have secured a permanent result and fell back on fine gold leaf (24 carat). All the gold in the curtains has been lacquered, and some of it coloured as well, lest it should compete with the pure gilding of the reredos.

Much eloquence is expended on the subject of stained glass, and considerable impetus has been given to it through the training bestowed, but this is the least part of the matter. The true practice of stained glass is no doubt found where the artist designs, executes and directs the work himself. Its fundamental requirements are not, however, wholly included in this, but in the endowment and direct vision which inspire it. When we speak of the more rare work of the personal craftsman we are not distinguishing only between sound methods of workshop practice, which are necessarily included in the best results, but between the craftsmanship which can be taught and the vision and treatment which are personal endowments of the individual. It is because we forget this that we fail to distinguish truly. I do not know that the fostering of a certain class of craftsmanship —all right of its kind—at all fosters the prospects of art. Nay, it has in many ways gravely obscured them. Art has to be extricated, and is, in fact, being extricated from all this sort of fostering, and reveals itself as something altogether separate and apart from the bulk of that which is now being so sedulously exploited as industrial art. The latter has its place; but if we were to suppose that this present "industrial art" movement could in any way replace or become an adequate alternative for the artist's personally endowed vision, we should be very much mistaken. "The marriage of art and mass production" is the slogan of the salesman, not the artist's vision of the conversion of the future through beauty.

DETAIL.

Mural Decoration, Mortuary Chapel, St. Alban's, Holborn.
By MR. C. W. WHALL.

The principles governing mural painting require that we should respect our work well enough to do it the right way and not be hirelings, embracing the obligations which its nature imposes on us, no longer lazily acquiescing in studio substitutes. And so with the art of stained glass; it is not enough that we should acquire the technical methods of its practice, but that the artist in us should be ever seeking towards new discovery and combinations, that it may not remain merely derivative, second-hand, and a survival only, but become the expression in its own way of the best experience and endowment of the artist's vision to-day. When this happy occasion arises we shall not look for an output of three windows a week as any recommendation, or for any commercial substitutes to supply for us what only the heart of the artist can give; nor shall we look upon mural painting as a resource for unemployed students aided by their professional art masters, or think that any artificial fostering will supply that which only the artist creates. It is to extricate art from all the tangle of interests, compromises and motives which beset it to-day and to restore it to its own clear and authentic purposes, that we need so much to re-state our beliefs, for it is only through clearness as to these that it can communicate its beauty and delight to the world.

The love of nature which guides the artist unfolds to him ever new revelations out of her inexhaustible treasury. How often, when we have thought to reach beauty through some preconception of our own, the sitter has taken some new position—a slight change of movement and gesture—unfolding a beauty exceeding any intention of our own. So the artist, humbled the more by what so much transcends him, yielding himself more completely to her inspiration, through service to nature and art, finds truth and beauty to be one—the interpreter of life and of all its fairest issues.

The examples illustrated comprise reference to one or two examples only which are typical of that improved temper in work which is now growing through the younger men; one which, while retaining the traditions and precedents that properly belong to all sound practice, develop an expression which is at once personal, endowed and efficient in technique.

THE LAW RELATING TO BUILDING.

BY W. T. CRESSWELL, LIC.R.I.B.A.; ASSOCIATE S.I.; F.R.S.I. (*Barrister-at-Law*).

I.—INTRODUCTORY.

THE above title is chosen to indicate the subject matter and scope of this and following articles, although, at the outset, paradoxical as it may seem, it must be stated that there *is* no particular law relating to building as distinct from, and beyond, the general laws relating to "agency," the rights and liabilities of architects, surveyors and others concerned with the carrying out of building works, being exactly the same as those of any "agent." The full definition of such rights and liabilities would necessitate a complete survey and résumé of the law relating to "persons."

Architects and surveyors, then, are neither protected nor harassed by any statutory rules and regulations governing the practice of their professions, their incident rights and liabilities. Those who are not members of any recognised society or institution, within the personnel of their profession, are free even from any code of professional etiquette regarding either practice or scale of fees.

It therefore follows that any private person may tout for practice as an architect or surveyor. His risk is, that if his client or employer is dissatisfied, the latter may sue him at law for negligence, incompetence and "not having used ordinary care and skill." In the case of Lanphier *v.* Phipos (1838) 8 C. and P. 475, Tindal, C.J., said: "Every person who enters a learned profession undertakes to bring to the exercise of it a reasonable degree of care and skill; he does not undertake, if he is an attorney, that at all events you shall gain the cause, nor does a surgeon undertake that he will perform a cure; nor does the latter undertake to use the highest possible degree of skill. There may be persons of higher education and greater advantages than he has; but he undertakes to bring a fair, reasonable and competent degree of skill."

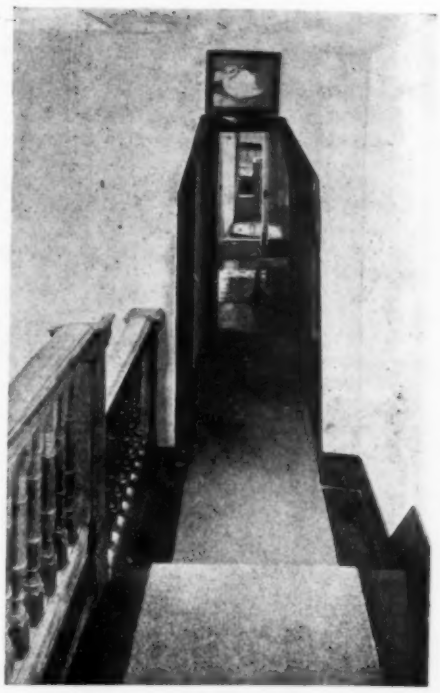
In fine, the only protection and guarantee provided for the public in reference to persons functioning, or seeking to function, as architects and surveyors, are the rules and regulations of various societies and institutions which formulate codes of etiquette, scales of fees, &c. But it must be clearly understood that these rules and regulations only affect continued membership of these bodies, and that expulsion or suspension from such bodies is no disqualification against practice.

Whereas, in such professions as are "registered," *e.g.*, the legal, medical and dental, these rules and regulations are statutory, and legal powers, of varying degree, are vested in their societies and institutes. The General Medical Council may take proceedings under the Medical Acts to strike off the medical register the name of any misdemeanant. The Law Society has power to strike off the roll of solicitors any misdemeanant (appeal being permitted in the Divisional Court); and in the Benchers of each Inn of Court is vested the power to expel, and thereby disqualify for practice at the bar, any offending member. In fact, "reasonable and competent degree of skill," in a registered profession may be said to mean membership of one of its recognised societies.

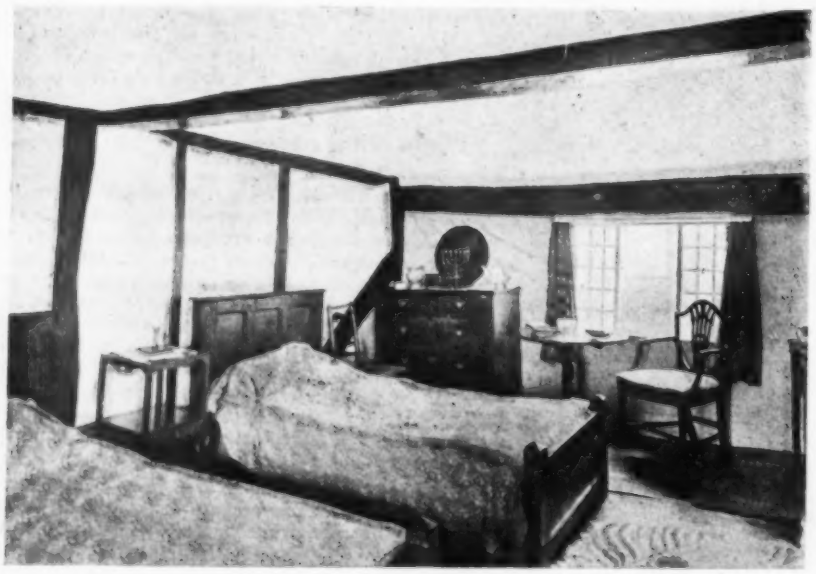
In the building professions, no licence is required to practise; but if either an architect or surveyor wish to act as valuer and appraise property, real or personal, and to recover fees for this work, he must hold a licence under Section 1 of the Revenue Act (1845) and Section 6 of the Revenue (No. 2) Act (1864). Should he value or appraise without a licence, he is subject to a penalty of £50 under Section 21 of the Inland Revenue Act (1890). In Palk v. Force (1848), 12 Q.B. 666 it was held that for an appraisement or valuation, made in one single instance, the licence fees and duties *must be paid*. Under Schedule 1 of the Stamp Act (1891) "appraisements and valuations made for, and for the information of, one party only, and not being in any manner obligatory as between the parties, either by agreement or by operation of law, e.g., approximate estimates, are not liable to stamp duty nor subject to the obligation of a licence."

"A valuation" must not be confused with an "arbitration." The latter is the outcome of dispute between parties, the former is not.

Architects and surveyors are then in fact persons holding themselves out to the public to perform as agents recognised functions requiring certain skill, and they therefore hold out the implied guarantee that they possess such skill. Membership of any recognised institute or society, or even proof of any special training, is not necessary to maintain an action for the recovery of "reasonable fees. However, proof of incompetence or lack of skill will not only defeat such an action, but will also uphold a claim for damages should loss or injury result to the employer; and even, may be, a claim of criminal liability, in case of fatal accidents resulting therefrom. (These liabilities will form the subject matter of a subsequent article.)



"Ockhams," Edenbridge. A CORRIDOR.



"Ockhams," Edenbridge. A BEDROOM.
MESSRS. BAILLIE SCOTT & BERESFORD, Architects.

Qualifications.

In these allied professions, therefore, the essential and real qualifications may be summed up as follows:—

I.—*For the architect*:

(*a*) Expert knowledge of design, styles, orders, &c., and of town planning.

(*b*) Skill in the preparation of plans, drawings and designs, defining, and as a guide to the carrying out of, proposed works.

(*c*) Knowledge of construction and materials to be used, with the application and use of these materials.

(*d*) Knowledge of Building Acts and by-laws, the requirements of local authorities, sanitary laws, easements of light, air, support, &c., relating to public and private buildings.

(*e*) The preparation of approximate estimates for works proposed.

II.—*For the building surveyor*:

(*a*) Skill in measurement and survey of land and the "development" of land.

(*b*) Skill in valuing property for mortgage or other purposes.

(*c*) As (*d*) in "for the architect," above.

(*d*) An intimate knowledge of the law of dilapidations, compensations, and arbitrations

III.—*For the quantity surveyor*:

(*a*) Expert knowledge of building construction.

(*b*) Such knowledge of the styles and orders of architecture as will enable him to describe correctly particulars and details of the works.

(*c*) As (*d*) above, "for the architect."

(*d*) An expert knowledge of the mode of measurement of superficial, cubical and lineal dimensions; "numbered" items of various trades and other artificers' work employed in the erection and completion of buildings, together with the monetary value thereof, so that he may be able to place before the builder bills of the exact quantities of all materials and labour required, upon which bills the builder may make a correct estimate of cost for the purpose of tendering.

It may be mentioned that certain institutions and societies possess charters granted by the Crown giving them certain privileges and official recognition.

ENTRANCE FRONT

GARDEN FRONT

"Ockhams," Edenbridge. MESSRS. BAILLIE SCOTT & BERESFORD, Architects.

EGYPTIAN OBELISKS AND WORKMANSHIP: WITH A NOTE ON STONEHENGE.

By W. R. LETHABY.

THIS excellent book* by an expert is all first-hand observation or fresh thinking over the problems involved. The substance is technical; but the results are presented in such a clear, explanatory way that anyone might read it with ease. The author gives the history of an obelisk from the moment the ancient Egyptian engineers arrived at the granite quarries of Aswan until it was erected a finished monument of one block, weighing anything up to 1,000 tons. The author's recent clearance of the gigantic unfinished obelisk lying in the Aswan quarries has enabled him to be very definite on the main points of the problem. The book is fully illustrated, special attention being given to examples of the old technique seen in the quarry.

In the first chapter a general account of obelisks is given. Their origin and significance are somewhat obscure; "In sanctuaries of the fifth dynasty the obelisk took the place of the holy of holies of the later temples. Recent excavations have shown that these were different from those familiar to visitors . . . the shaft merely served the purpose of elevating the sacred pyramid or *ben ben*—the real emblem of the sun." The author then passes to an account of the great unfinished obelisk at Aswan, "which was never cleared until the end of the winter of 1922: all the visitor could see was the top surface of the *pyramidion* and about 20 yards of shaft, which sloped down into a vast heap of sand, chips and granite boulders. The obelisk is a piece of work that failed owing to an unexpected fissure in the rock. . . . Here we may see gigantic embankments on which the great blocks were transported, half-finished sarcophagi, and statues abandoned in various states of completion." The partially-isolated mass of granite, which is surrounded by a worked-out trench, is 137 feet long and would weigh about 1,160 tons. On it are many setting-out lines and measurements which are explained by the author. The trenches about the great mass were made by pounding with lumps of hard, greenish-black stone (*dolerite*): "All over the quarries, and especially round the obelisk, may be seen hundreds, some whole and some broken."

A long chapter treats of "architects" who erected obelisks: "The ancient records give us glimpses of the men who were responsible for their quarrying and erection. . . . Fortunately, the tombs of most of the obelisk architects are known to us, since their efforts were usually rewarded by the present of a tomb in the most fashionable part of the Theban necropolis." Here they recorded "what good workmen they were, how well they treated their subordinates, and the titles and decorations granted to them. But they say nothing as to how they did their job. . . . One obelisk at Karnak was erected by a noble called Ineni—Pasha, Count, Chief of all the works in Karnak, &c., &c. . . . After assuring us that he was a really first-class engineer, and immensely popular, he records the death of the King. . . . I became great beyond words; I will tell you about it, ye people; listen and do the good that I did—just like me. I continued powerful and met with no misfortune; my years were spent with gladness. I was neither traitor nor sneak, and I did no wrong whatever. I was foreman of the foremen and did not fail."

A second obelisk at Karnak was erected by Sennemut, chief "architect" at Karnak, Luxor, &c., &c. So great a favourite was he with the queen that he shared with another the bringing up of her daughter and heiress. A statue showing Sennemut holding the child Nefrurê (pretty name!) is illustrated. The queen's power seemed to rest on Sennemut and two other nobles (one of whom was also "an expert in obelisks"). His titles were Pasha, Count, Royal Seal-bearer, Sole Companion, &c., &c. "There is no doubt that Sennemut was the power behind the throne." An inscription says: "I was the greatest of the great in the whole land; one who had audience alone in the Privy Council. I was the real favourite of the King; foreman of foremen; superior of the great; one to whom the affairs of Egypt were reported. . . . I was a noble who was obeyed, I had access to the writings of the prophets; there was nothing which I did not know concerning what had happened since the beginning." His name appears at the quarry—"Sennemut came in order to conduct the work of the two great obelisks." Another of these "architects" was Controller of the Houses of Silver and Gold, High Priest of Ammon, and Director-General of Craftsmen: "I inspected when his Majesty erected obelisks. I pleased his Majesty while conducting the work on his monuments."

A fourth "architect" was a priest and prophet, and then High Priest of Ammon for twenty-seven years. He was Chief Overseer of Works to Rameses II: "I made for him a temple. I erected obelisks whose beauty approached Heaven. I made very great doors of electrum. I hewed very great flagstaves. I made great barges, I the Pasha and High Priest of Ammon."

I wonder what the exact meaning of the signs here and elsewhere translated "architect" may be? These high priests and nobles were, it is clear, rather ministers of state and commanders of the great "army" of labour engaged in building works than architects in any sense that we can understand. They were not chief workmen, but high commissioners and chief permanent secretaries of the Office of Works.

There is an interesting—especially to Londoners—reference to a later architect proper in the account of the obelisk now on the Thames Embankment. It and another now in New York were once a pair at Heliopolis and both had been moved to Alexandria in Roman times. Ours had fallen, but the American obelisk was still standing. The angles at the bottom of this one had been broken and bronze blocks had been put at the corners to support it. These were in the form of sea-crabs, and bore inscriptions in Greek and Latin, giving the name of Pontius the architect (APXITEKTON), who set it up at Alexandria in the year 13–12 B.C. (A photograph of one of these fine bronzes was once sent to me from New York. A reproduction of the original with a short description of the facts, if inserted in the base of the London monument, would add to its interest.)

The account given by the author of the methods of searching for suitable material, setting out the lines of the monument, and extracting it from the quarry are most informing. Long straight lines seem to have been obtained by vibrating a stretched string as carpenters do to-day. Flat surfaces were tested, either by sighting three rods (compare a much discussed passage in Vitruvius), or by testing, "as in engineering work to-day, by putting against them (the surfaces) a portable flat plane smeared with red ochre and oil, or 'ruddle,' as the red-lead and oil now used for the purpose is called." (The same method was made use of by the Greeks and the "red canon" is mentioned in their "specifications.") A block of granite was detached as mentioned above by pounding out a trench around it, thus breaking up the granite into a powder. "Nowadays work with rammers is always done to a sort of chanty, and there is ample evidence that the ancients made similar use of songs. With a good chanter who can extemporise rhyming lines full of personalities the work the Egyptian can do is little short of marvellous." The author experimented with this pounding method of working granite and proved that it can be done quickly.

Passing to the erection of the completed monolith, the author objects to Choisy's suggested method and works out another whereby it was gradually lowered from a ramp of earth into a funnel-shaped pit filled with sand. On the sand being gradually removed, the great block found its basis with exactness—"the obelisk is introduced into the funnel on a curved way leading from the surface of the embankment. The sand is removed by men with baskets through galleries from the bottom of the funnel." All this is clearly explained by photographs from a working model.

On reading in the short reference to the earliest obelisks the statement that the small pyramid at the apex seemed to be the essential part, and a symbol of the sun, I turned to the index to see if the great monumental pyramids were mentioned, but they are not. More than thirty years ago I was drawn to the conclusion that the pyramids must represent the Universe as conceived by the Egyptians, and I wonder now whether the sun symbol is not the pyramid of rays falling on the square earth from the sun at the apex of the "firmament?"

. . . . . .

A point of special interest appears in the fact that the author by carefully analysing the measurements marked on the granite finds that a foot of 11.77 inches was used for the setting out. This foot is practically the same as the Roman foot, which was used for works executed in London. It is also the Greek foot used (for instance) in the erection of the Temples of Artemis at Ephesus going back to the eighth century B.C. Our modern English foot which is about a quarter of an inch longer than the Egyptian foot must come from the same standard through the Greek and the Roman. Some years ago I ventured to suggest in *The Builder* that as the diameter of Stonehenge was about 97 feet English, it looked as if it had been set out to be 100 antique feet. The carrying back of such a standard to Egypt makes this possibility less unlikely, and what follows must be considered with the same question. Stonehenge is a wrought stone monument and the stones were dressed (as clearly appeared on a surface then newly exposed, which I saw many years ago when a lintel fell) by *bruising* off the surface rather than cutting it. A large number of hard stone "mauls," or hammers, were found in the excavations of a few years ago which it was agreed had been used in the execution of the work. The discovery that obelisks in Egypt were dressed with hard stone boulders is a full confirmation as to the method of work at Stonehenge, and another link of connection with Egypt. "The trench and pits [in the granite rock] were not cut out, but rather bashed out. . . . These balls measure from 5 to 12 inches in diameter, their weight averaging 12 pounds. The blows were struck vertically; this suggests that they were shod on to rammers. . . . The next step was to render the surface flat. This was done entirely by bruising with the balls of dolerite. Examples of unfinished dressing can be seen." Again, it seems obvious that the great lintel stones at Stonehenge were lifted on an earth ramp such as seems to have been the most usual form of scaffolding in Egypt. Recent studies have brought out an increasing likelihood that megalithic monuments spread from Egypt, and the points just mentioned are evidence in the same direction. The precision and accuracy of Stonehenge as an *architectural* monument is hardly understood. When it was new it must have been dazzlingly fair. Again, decimal numbering seems to have been used in the "design" of the monument. There were five great trilithons, having 10 uprights and 15 stones in all, and the circle has 30 uprights and as many lintels, 60 stones together; 5, 10, 15, 30, 60, 75 is a series that seems to point to a decimal base, and this makes a diameter of 100 units all the more probable. Considering the character of the work, I cannot think Stonehenge earlier than, say, 500–800 B.C., a thousand years more recent than is generally supposed.†

* "The Problem of the Obelisks: From a Study of the Unfinished Obelisk at Aswan." By R. Engelbach, Chief Inspector of Antiquities, Upper Egypt. (London: T. Fisher Unwin.) Price 9s. net.

† What is said of numbers and measures at Stonehenge is, I find, a memory of a remarkable study of the monument made by Sir W. Flinders Petrie some forty years ago. The ancient foot, he deduced, was 11.72 inches, "a unit originally derived from Egypt that may have been introduced at any date into Britain."

LIVING ROOM

"Ockhams," Edenbridge. MESSRS. BAILLIE SCOTT & BERESFORD, Architects.

ITALIAN TRAVEL NOTES.

I.—SOME ADVICE TO STUDENTS.

BY THEODORE FYFE.

STUDENTS of architecture come and go, but they all go to Italy—at least, they all ought to go if they don't. Now going to Italy is an easy thing. One can take a ticket at Cook's, decide to take a particular boat train, and just get there. After a certain experience—the journey and arrival, to wit—one can find oneself on a cool, dark night, or on a light morning, in Milan or Turin or even Venice. How much exactly one gets out of the experience of journeying depends to some extent on one's youth, but more on one's zest for strange things. The love of travel is a gift, but it may be fostered and educated. It is important to know in most things how to go to work.

First, as to *Equipment*.—Even more now than in the past it is valuable to travel light when on a tour of a few weeks. A journey of two or three months, or longer, is a more serious affair, but one way or another one's baggage demands care. I remember that on my first trip to Italy, when I was six weeks away, I was able to carry all my luggage and myself for a mile, when I was pushed to do it. As a considerable part of my luggage was sketching equipment, this was not a bad achievement. Clothes may be severely compressed and still be adequate. Dress suits are rarely required, and are best left behind, if serious study is intended. A good waterproof cape or light mackintosh is more important than an overcoat. A cape is really good, as it is admirable for keeping sketching things dry, and with it and an umbrella, heavy rain can be resisted. A strong waterproof lined canvas bag with a shoulder strap, made to hold one's drawing board and all materials, is a great thing, and one's razor, &c., can occasionally be dumped into it, when there is uncertainty if night will overtake an expedition. It is hardly necessary to expand on the actual sketching and measuring requisites, but an opera glass should be included, as it is often invaluable for detail. One thing should be borne in mind when thinking of clothes—it is often advisable to look as like an Italian as possible. A good, unassuming lounge suit will always be safe, as the Italian male likes English fashions, but the Italian hat is more subject to the passing vagaries of fashion. Therefore, it is not a bad plan to travel in an old hat that will crush away, and buy a new one—which may be cheap—in the first good-sized town in Italy one stops at.

Second, as to *Language*.—Few English people know Italian well, or take the trouble to cultivate its accent. It is very important to do the best one can beforehand in this respect, but even a carefully-studied phrase book is much better than nothing. It is easier, I think, to get up a fair working knowledge of Italian, than of most other European languages, and if one studies pronunciation, the way is made much easier to understand the Italian when he talks fast to you. Talk all the time; the Italian is very courteous and will listen to you if he knows you are trying. Go to Italian inns; if you are blessed with a good digestion, you will feed more healthily and interestingly if you do. Don't go to swagger hotels and mix with English people, or you will miss half the pleasure of travelling in the by-ways. For this last, the small print of Baedeker is invaluable. Use your Baedeker discreetly, but use it. It is worth all its weight—not, after all, considerable. You can learn about the country in all sorts of ways if you will. Scorn not the obscure café or the wayside vendor of fruit. If you drink a country's wine you drink other things as well, besides keeping healthy. It is remarkable how the real instinct for travel is fed by simple things and how many Britishers miss this matter. Another great way of learning the language is to travel third class in local journeys and to talk to the country folk. The Italian countryman is a simple, primitive person, glad to know about you and your doings, though not inquisitive in an annoying sense. You can listen to his idioms with advantage, and practise your halting phrases on him with impunity, as talking to him is like talking to a child. It is very pleasant to bowl along quite comfortably in an omnibus train in the summer time, with no draughts, as there are merely openings where windows usually are.

When you have once got even a hand-grip on the language, buy newspapers and try and master a little bit of one every day. Listen to railway officials calling out the names of stations in journeys and keep a sharp ear for the stressing (or otherwise) of the penultimate syllables—a great deal of Italian pronunciation hangs on that. A friendly waiter will often teach you a lot and you can ask him in an off moment to read a bit of your newspaper, and thus check your own attempted pronunciation of the same. All this tends to the ultimate object—to understand the Italian when he talks to you.

Third, as to *Food and Accommodation*.—If you are a novice, it is as well to begin in a fairly good hotel where some English and French is spoken, taking your breakfast in it and an occasional dinner, but taking most of your meals in outside cafés or restaurants. There is at least one good eating house or *trattoria* in every place that is more than a village, and there you can sample Italian dishes, as a good working knowledge of these gives you an immense pull. There is nearly always an ordinary (*piatto al giorno*), and this can be counted on with fair certainty to be both reliable and satisfying. Quite often it is very appetising. In a primitive village you are best at the inn for all your meals, and at the worst you can fall back on cheese and fruit, with eggs if you can get them, and an occasional cut of roast veal (*arrosto vitello*), or a beefsteak (*bistecca*). When you are more up to things, it is often a good plan in a town to stay at a lodging (*locanda*), and take all your meals out, though such places will often arrange to give you morning coffee, rolls and butter. If you go to an inn (*albergo*), choose it with care. The best ones have a popular *trattoria* attached, and you are nearly always both well housed and well fed in such places. If you leave your baggage at the station, you can sample one or two before you settle down. Real Italian inns are usually clean and comfortable, even though the sanitary arrangements are primitive, and I have only once met with a damp bed. Your room won't cost you much, especially if you bargain for it and make a quiet fuss about essentials. Shut the door and put a clean tumbler under the sheets of the bed for a few minutes: if it comes out clear, the bed is quite dry. After a long journey and you arrive at your inn at night, there is one comforting item which can be obtained over the length and breadth of Italy—a glass of *zabaglione* (yolk of egg skilfully mixed with sherry)—which is both food and drink.

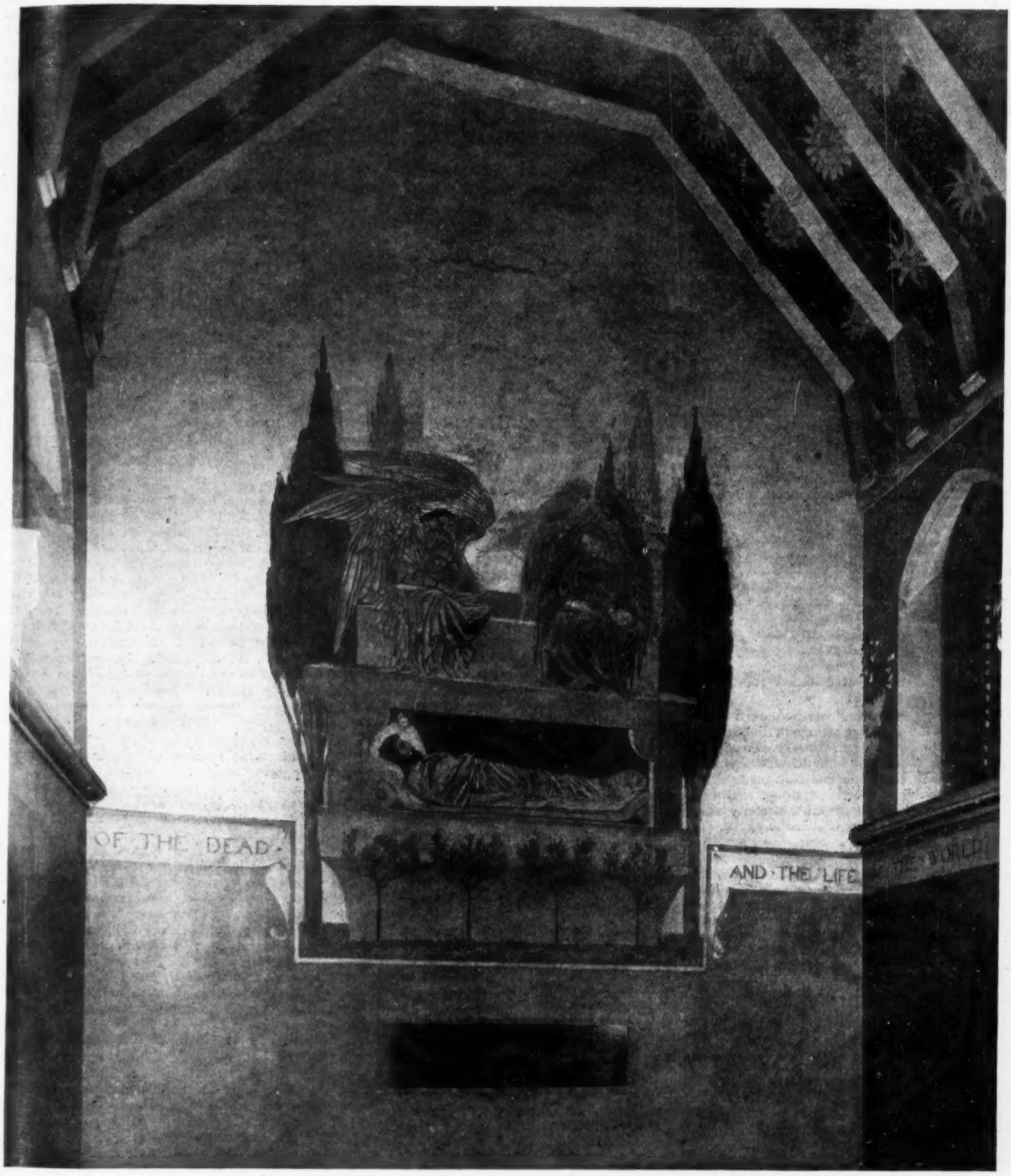
Fourth, as to *Work*.—For every architectural student who goes to Italy with a definite purpose there are at least five who go with only vague notions. To these I would say: map out your tour, and know, as far as possible, the things you must see. You will very soon discover things you want to sketch or measure, and you should lose no time in getting down to them; but don't miss the larger view. In any small town, find out the local characteristics in painting as well as architecture, and broaden your outlook by a visit to the local museum or picture gallery. It is a good thing to begin there. Visit your churches early, both for light and because many of them close at noon. In larger towns you will want at least a day to do your main sightseeing, but even in them you should quickly devote the best half of the day to work. It is astonishing how careful study of one subject will teach you about other things. Do not try and see too much at one time or you may get bewildered and do nothing. It is a good plan to concentrate on a particular line of study and stick closely to it. I once had five days to spend in Sicily and a wise traveller advised me to concentrate on the work of the Mediæval period; I took the advice and have never regretted it. Some day I will go back and see the Classical work. This is a big subject, and hard and fast rules cannot be laid down; but a temptation to the student to become aimless certainly exists, tending to lead him away from the education of eye and mind and hand by serious study. We learn in fact, by activity, not by discursive sightseeing; but a morning of meditative wandering with a purpose is sometimes true activity.

Fifth, *Where to go*.—Italy is a land of contrast, but it is one country. You can go to the north in the autumn or the spring, but need not necessarily avoid all the south in the summer. The worst months are, perhaps, August (because of dusty heat) and November (because of mosquitoes). But with discretion one can travel through the length and breadth of the land at any season of the year. Bari, in Apulia, is delightful in July; an hour of the forenoon can be occupied by bathing and an hour of the afternoon in resting. Hill towns like Perugia, Assisi and Siena are delectable all through the summer, and a short stay at Naples can be as fascinating in June as in February. In September make for the real north—the Trevisan or the Val Camonica—and avoid a long stay at malarious places like Ravenna. But if you feel done up at Ravenna, you can pick up Rimini, not to mention Urbino. Ancona is a fascinating bathing resort like Bari.

Where to go is as big a subject as what to do, but here again one must concentrate. There are beats that must be done *in toto*, by themselves, and in a tour of a few weeks it is unwise to try and see Rome as well as Venice. Some useful lines of study are (a) the north beat from Milan to Venice, west to east, taking in Pavia, Saronno, Como, Bergamo, Brescia, Verona, Vicenza, and Padua; (b) a more southerly beat west to east, from Turin, taking in Piacenza, Parma, Cremona, Modena, and Mantua; (c) the Marches, Bologna and Ferrara to Ancona, by way of Pesaro (for Urbino), and this might be made to include Ravenna and Rimini, or perhaps Spoleto; (d) an Umbrian trip; (e) the central west—Genoa, Pisa, Lucca, Siena; (f) Apulia. Rome, Florence, and Naples, all with their districts, can be taken by themselves. For the rest, one passes notable places like Pistoia, Prato, Orvieto and Montepulciano, on main line journeys. The wisdom of travelling light is proved when one decides suddenly to stop at a place, often a refreshing and useful thing to do; but such procedure must be worked out carefully in relation to ticket-taking.

Sixth, as to *Permits and Introductions*.—The Italian Government has now issued new regulations for admission and study in museums, galleries, &c. Bona-fide students can obtain permits, through the British School at Rome, for an annual tax payment of 10 lire. With such a permit the student could probably dispense with the usual letter of recommendation issued by the R.I.B.A., when seeking the good offices of the custodians of churches and other non-Governmental buildings. In general, it should be said that every personal introduction possible should be obtained beforehand, and this is particularly important for the Vatican at Rome. A letter to a member of the Scotch or Irish Colleges in Rome, or, better still, to some highly-placed ecclesiastic, is invaluable. The British Consul in any of the large towns is often a most valuable ally, but any assistance he could give in matters ecclesiastical could only be personal, not official. Except in the Vatican, a student who is courteous and civil-spoken to all, and who adopts Ruskin's invaluable advice of giving a sacristan a liberal *buona mano*, can usually secure all that he wants.

The second article in this series will deal with a northern tour from Milan to Venice.



Mural Decoration, Mortuary Chapel, St. Alban's, Holborn.

By MR. C. W. WHALL.

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ILLUSTRATIONS.

"The Builder" Calendar.

Our Calendar this year is a drawing, by the late H. W. Brewer, of Pardon Church and Cloisters.

A London Vista.

There is no finer vista of its kind in London than that depicted by Mr. Raffles Davison on one of our plates this week, where the long frontage of Somerset House is seen through one of the bridge arches. It must have been extraordinarily fine when the river came right up to the lower story of Somerset House.

New Building, Gresham-street and Wood-street, E.C.

This building has been designed as a City warehouse, which can be arranged, in part, to give office accommodation. Every consideration has been given to secure light both from the exterior and from the interior areas. The building is to be of Portland stone, and the expression aimed at is extreme simplicity and the avoidance of architectural display.

Messrs. W. H. Lorden & Son, Ltd., are the contractors; Messrs. Crittall Manufacturing Co. are supplying the metal casements; lifts by the Express Lift Co.; steelwork by Messrs. Dorman, Long & Co. The carving is to be carried out by Mr. P. G. Bentham, A.R.B.S. Mr. Bylander is the consulting engineer, and Messrs. Richardson & Gill, FF.R.I.B.A., are the architects.

Cambridge University: School of Bio-Chemistry.

This building has been erected for the University of Cambridge by the Trustees of the late Sir William Dunn. It will be occupied by Professor Hopkins and his staff as a School of Bio-Chemical study and research.

The contractors are Messrs. William Saint, Ltd., of Cambridge, who have carried out the work under the direction of their agent, Mr. Braine.

The building is constructed of fireproof material with sand-face brick exterior facings and Portland stone dressings with Clipsham stone base and York stone steps. The roof is covered with Dawson pantiles. The entrance hall and stairs are treated in Subiaco stone, and all furniture and fittings have been to special design and made by Messrs. Wm. Saint, Ltd.

The sub-contractors are:—Electric light and power, Messrs. Higgins & Griffiths, Ltd.; asphalte work, Messrs. Lawford & Co.; heating, ventilation, hot water, steam, compressed air and hot rooms, Messrs. Mumford, Bailey & Preston, Ltd.; carving, Mr. Joseph Whitehead; Subiaco stonework in interior, Messrs. J. Whitehead & Sons; metal casements and wrought-iron work, Mr. William Smith; locks and door furniture, Messrs. James Gibbons, Ltd.; sanitary fittings and laboratory sinks and wastes, Messrs. Doulton, Ltd.; blinds, Mr. B. Holden; roof tiling, Messrs. Roberts, Adlard & Co.; fibrous plaster, Messrs. F. De Jong & Co.; steel roof principles, Messrs. A. Dawnay & Sons, Ltd.; patent roof glazing, Messrs. Heywoods & Co.

The clerk of works is Mr. G. T. Murton, to whom the architect and trustee are greatly indebted for the care, attention and skill devoted to the work.

Sir Edwin Cooper, F.R.I.B.A., is the architect.

Menin Gate Memorial.

A description of the foundations of the Menin Gate Memorial is given on p. 72. Sir Reginald Blomfield, R.A., is the architect, and Dr. Oscar Faber, O.B.E., D.Sc., the consulting engineer. Messrs. Somerville are the contractors.

West China Union University, Chengtu, China: Principal Gateway.

This gateway is the principal entrance to the University. With its flanking colonnades it expresses the spaciousness and dignity of the component groups of University buildings, whose higher roofs will be visible from the wide square. The building is of local brick, the walls of the great arch being unrelieved save for some small windows. The roof is in the grey-brown tiles of the district with patterns of glazed tiles. Glazed tiles are used in the frieze and upper tower, while bright colour adorns the rafter feet, beams and carved brackets. Messrs. Fred Rowntree & Sons, of 11, Hammersmith-terrace, W.6, are the architects.

Memorial to the Missing at Cape Helles.

This monument is designed specifically for the place it will occupy on the top of a cliff with a sheer drop of 100 ft. Being a country subject to earthquake, special consideration had to be given to the foundations. The monument is 25 ft. sq. at the base, tapering to 10 ft. 6 in., and then raised in the form of an obelisk to a height of about 100 ft. above the raised platform. Four plain stone Nabresina panels bear the names of the warships and military units engaged. On the north side of the approach will be placed a panel bearing a dedicatory inscription.

Sir John J. Burnet, A.R.A., is the principal architect. The contractors are Sir G. F. Payne Gallwey, Brown & Co., Ltd., 58, Victoria-street, S.W. 1.

Memorial at Port Thewfik.

The site for this memorial is at the southerly point of a promontory jutting into the Gulf of Suez, and which holds a commanding position of ships passing through the canal. It will be executed in Nabresina stone, and is in the form of a square obelisk, 65 ft. high and 12 ft. square. It has a reinforced concrete foundation placed on timber piles. It will be fitted with panels bearing the names of the Indian Regiments engaged in the Egyptian Expeditionary Force. Two couchant tigers are represented as guarding the memorial—the one from the canal, and the other from the sea. Sir John J. Burnet, A.R.A., is the architect, and Mr. C. S. Jagger the sculptor.

Liverpool Cathedral.

We give two progress photographs, specially taken for *The Builder*, of Liverpool Cathedral. Mr. G. Gilbert Scott, R.A., is the architect.

"Ockhams," Edenbridge.

This house has been recently altered by Mr. Baillie Scott as a country residence for himself.

New Premises for the Anglo-Persian Oil Company.

The building illustrated on p. 64 is being erected on a site having four frontages—one to Moorgate, one to West-street, one to Finsbury-circus, and another to South-place-mews. The building, which is the largest at present being erected in the City of London, has been carried out to the design of Sir Edwin Lutyens, R.A., and for the Anglo-Persian Oil Company, Ltd., who propose to occupy the building with their own staff and with all their subsidiary companies, such as the British Petroleum Co., and others.

The building consists of basement, lower ground floor, ground and seven floors over. The general excavation was to a depth of about 30 ft., and was continued through the usual "made" ground and through the old Moorfield Marsh, which covered this district to a depth of nearly 10 ft. for a period of about five hundred years, being just outside the old London Wall. Antiquaries have made many interesting finds during the progress of excavation. The Moorgate frontage was close to the line of the old Walbrook, which passed this spot on the way to the Thames. The building is continued over the Moorgate Station, Great Northern & City Tube, the foundations of which are continued to a depth of about 90 ft. right through the existing tube to steel grillage below.

The general contractors for the work are Messrs. Howell J. Williams, Ltd., of 7-17, Bermondsey-street, S.E.; the steel construction is by Messrs. Redpath, Brown & Co.; artesian wells by Messrs. C. Isler & Co., Ltd.; central heating with oil fuel boilers by Messrs. R. Crittall & Co., Ltd.; steel sashes by the Crittall Manufacturing Co., Ltd.; electric wiring and fittings by Messrs. Higgins & Griffiths; plumbing by Messrs. Stitson, White & Co.; synchronised clocks by the Synchronome Co., Ltd.; locks by Messrs. Joseph Kaye & Son; slating by Messrs. Sterling & Johnson; lifts by Messrs. Waygood-Otis, Ltd.; stone preservative to the Portland stone fronts by Messrs. Raines & Porter, Ltd.; pneumatic tubes installation by Lamson Pneumatic Tube Co., Ltd.; marble by Messrs. H. J. Jenkins & Sons, Torquay; internal telephones by the Relay Automatic Telephone Co., Ltd.; strong-room doors by the Chatwood Safe Co.; hardwood partitions and fittings by Messrs. Howell J. Williams, Ltd. The carving has been executed to the designs of Sir Edwin Lutyens, R.A., by Messrs. Broadbent & Co.

Progress Views.

The progress views show typical examples of the large number of commercial buildings now being erected in Central London. They include the new premises of the Anglo-Persian Oil Co., in Moorgate-street (Sir Edwin Lutyens, R.A., architect); the "Fortune" Theatre, Russell-street (Mr. E. Schaufelburg, architect); Banque Belge pour l'Etranger, Bishopsgate (Sir Edwin Cooper, F.R.I.B.A., architect); alterations to the Criterion Restaurant (Messrs. Wm. Woodward & Sons, architects); Messrs. Peter Robinson's premises, Oxford-street (Messrs T. P. & E. S. Clarkson and Mr. Austen Hall, joint architects); Messrs. Liberty's premises, Regent-street (Messrs. Edwin T. Hall, F.R.I.B.A., and E. Stanley Hall, M.A., F.R.I.B.A., architects); and new premises in Holborn (Messrs. Gilbert & Constanduros, architects).

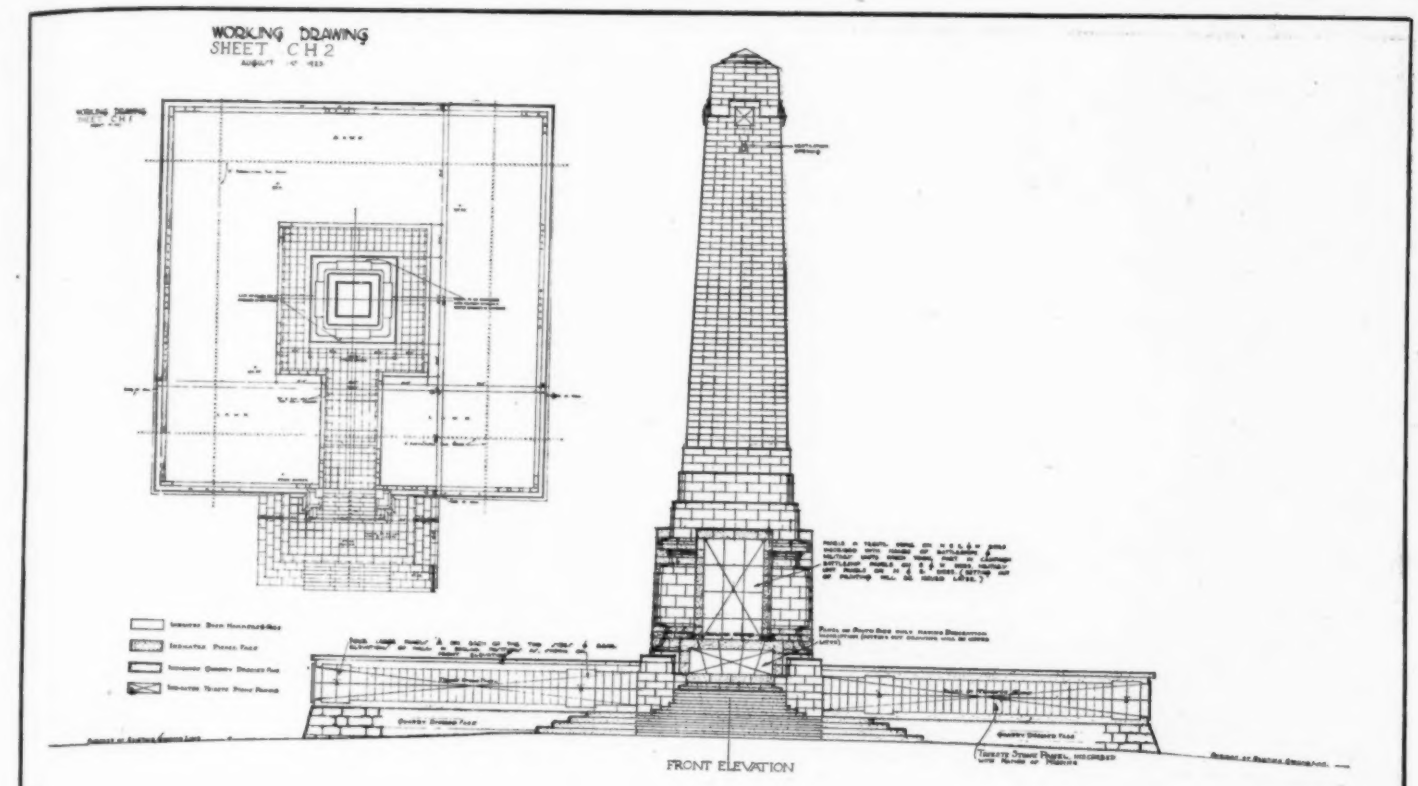
Nos. 105-109, Strand.

This building, which consists of two basements, ground floor and six floors above, will have a Portland stone front in which there is no main cornice. Part of the site was originally Terry's Theatre. The premises will have a considerable depth, and will overlook the Savoy Chapel and square at the rear. A feature of the site is the way in which it falls away at the back. This drop is so great that even the floor of the sub-basement will be at ground level at the far end of the premises, and both basements will light directly on to the road. The contractors are Messrs. Rice & Son.

Messrs. Trehearne & Norman are the architects.

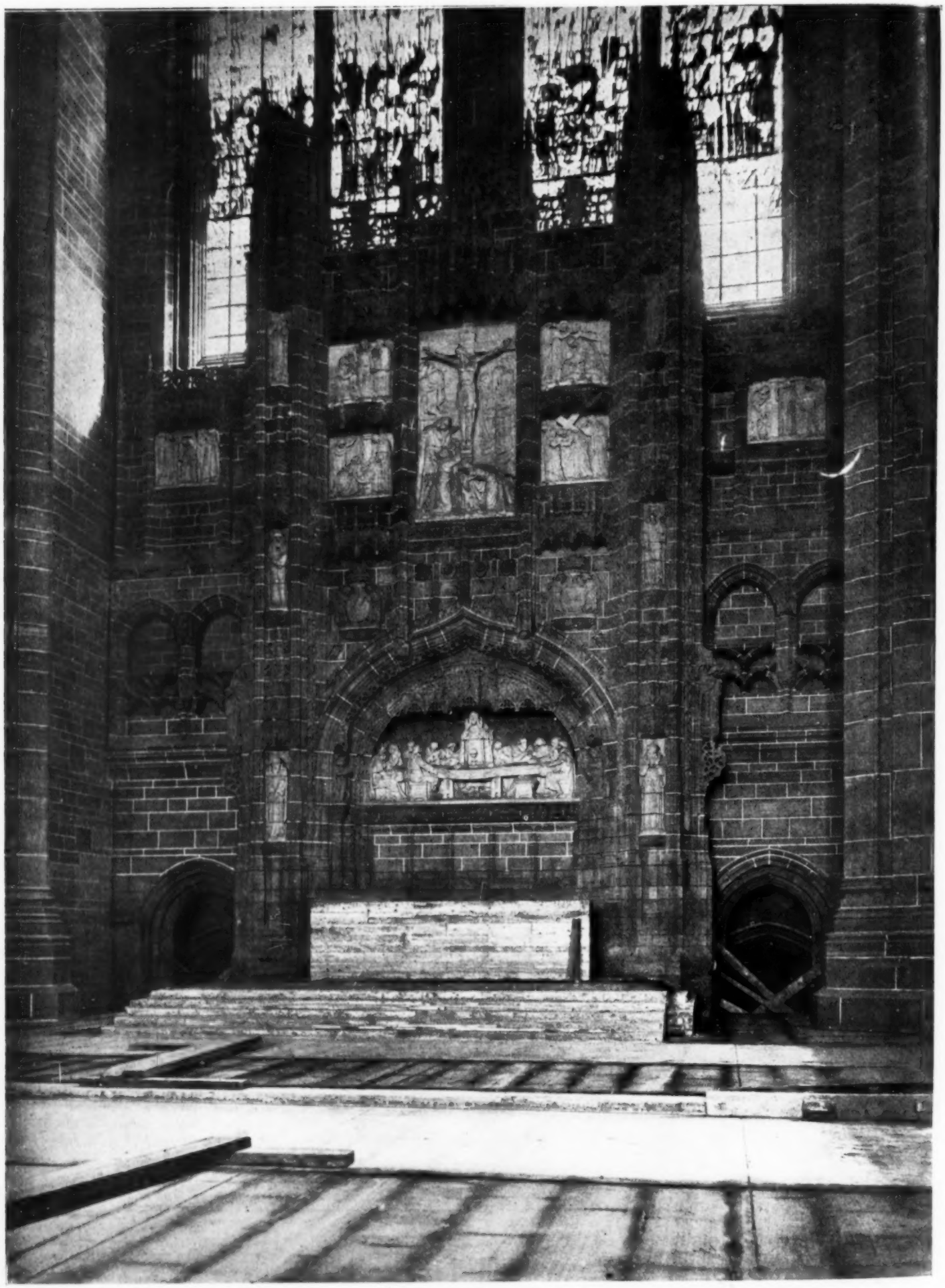
New Premises for the Gresham Life Assurance Society, Ltd.

A description of this building, for which Mr. T. B. Whinney, F.R.I.B.A., in conjunction with Messrs. Campbell Jones, Son, & Smithers, are the architects, is given on p. 67.



Cape Helles Memorial.

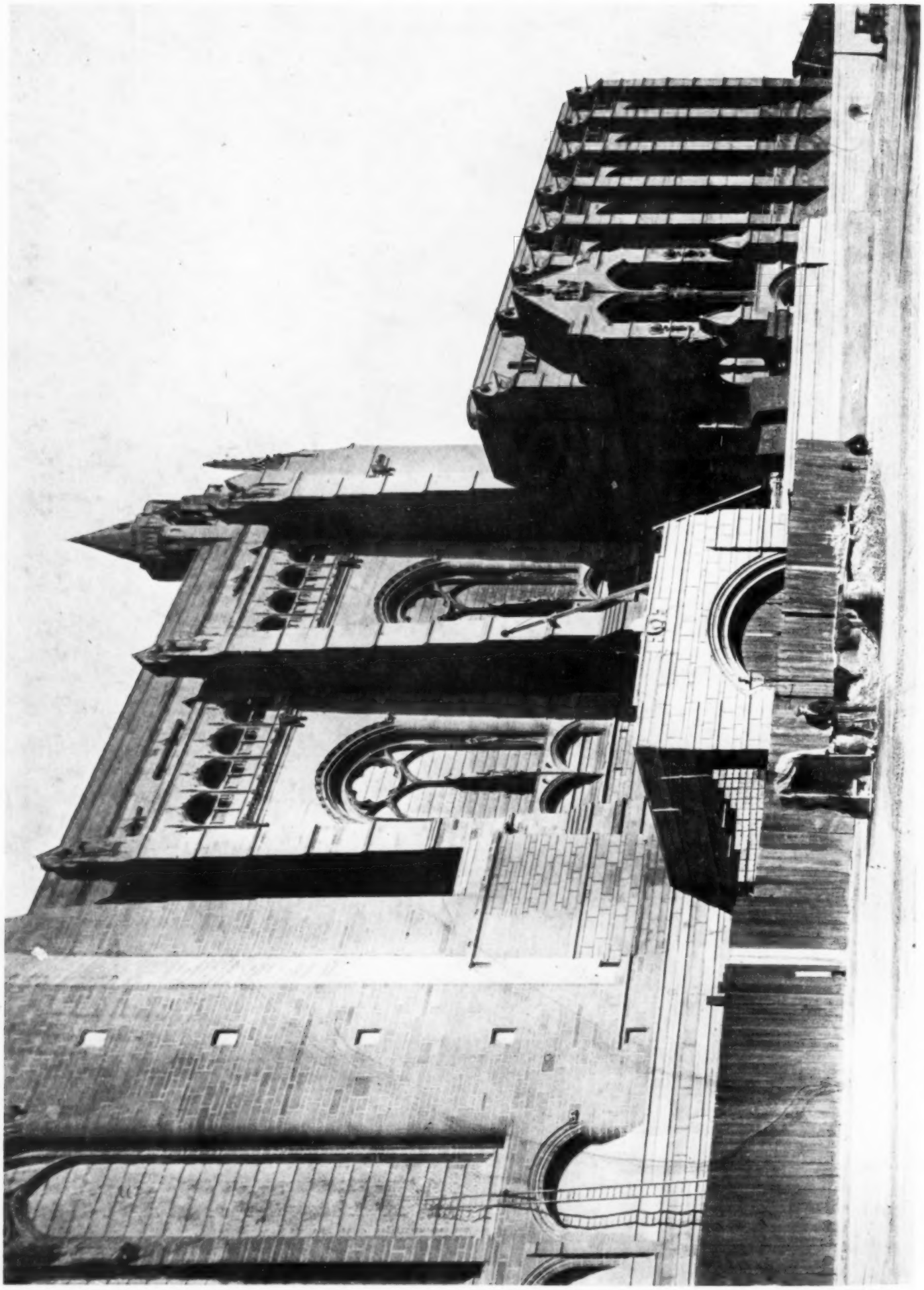
SIR JOHN J. BURNET, A.R.A., Principal Architect.



Liverpool Cathedral: A Recent View Specially Taken for "The Builder."

MR. G. GILBERT SCOTT, R.A., Architect.

UNIV. OF MICH.



Liverpool Cathedral: A Recent View Specially Taken for "The Builder." Mr. G. Gilbert Scott, R.A., Architect.

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THE LIBRARY.

Cambridge University: School of Bio-Chemistry.

Sir Edwin Cooper, F.R.I.B.A., Architect.

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Cambridge University: School of Bio-Chemistry.

SIR EDWIN COOPER, F.R.I.B.A., Architect.

MAIN ENTRANCE.

Cambridge University: School of Bio-Chemistry.

SIR EDWIN COOPER, F.R.I.B.A., Architect.

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THE STAIRCASE.

Cambridge University: School of Bio-Chemistry.

SIR EDWIN COOPER, F.R.I.B.A., Architect.

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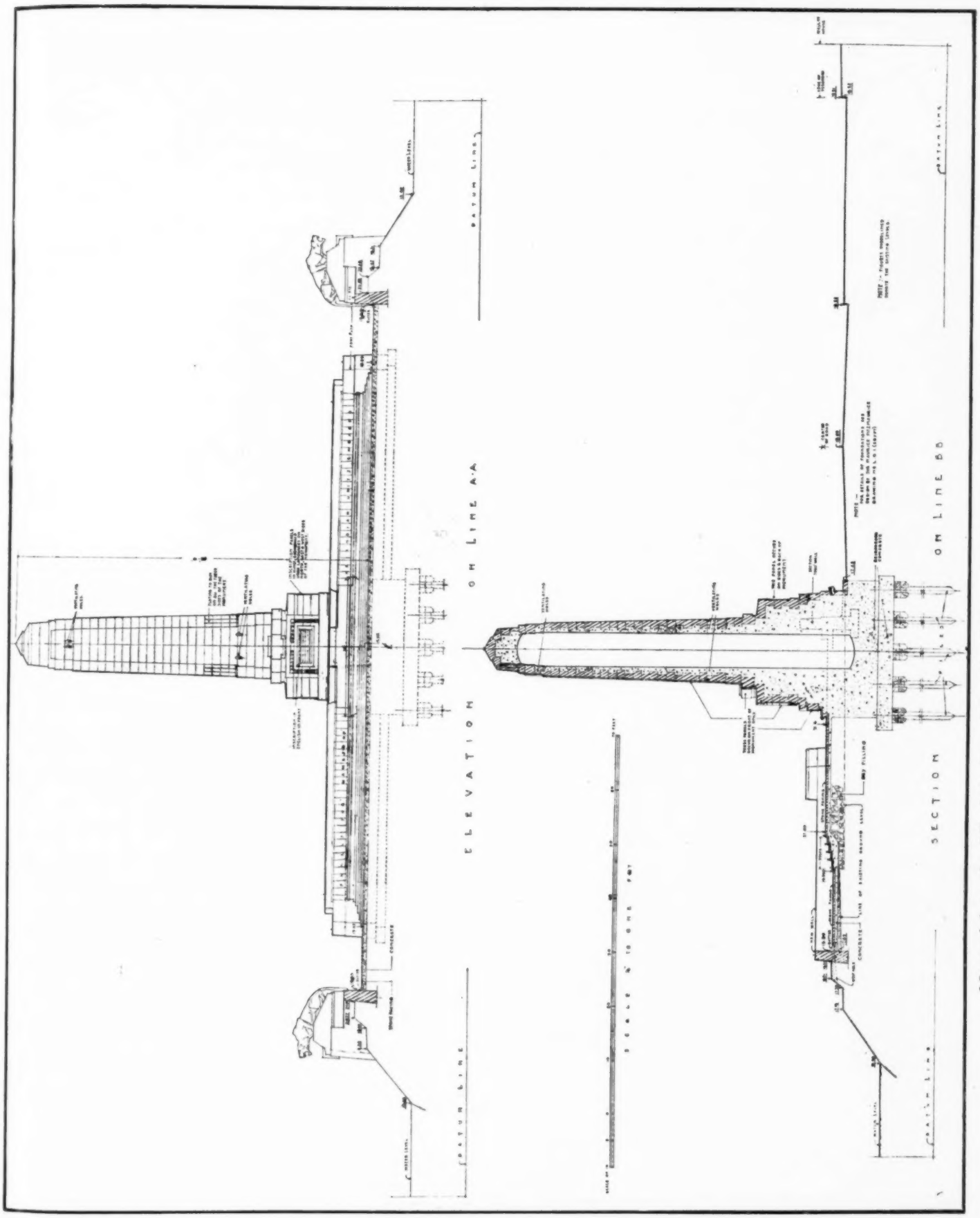

Memorial to the Missing, Port Thewfik, Egypt. Sir John J. Burnet, A.R.A., Principal Architect.

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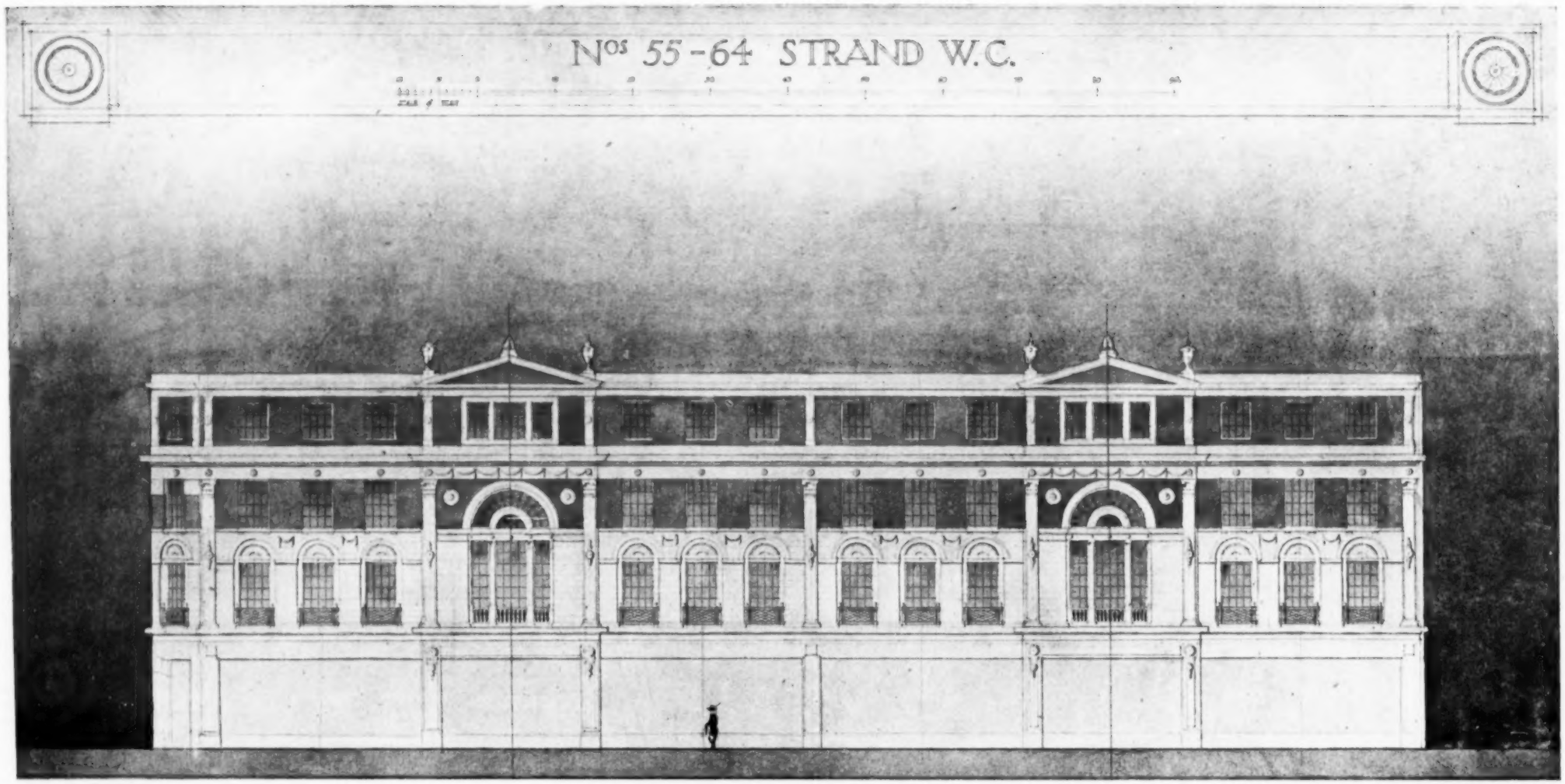
Nos. 105-109, Strand, W.C.

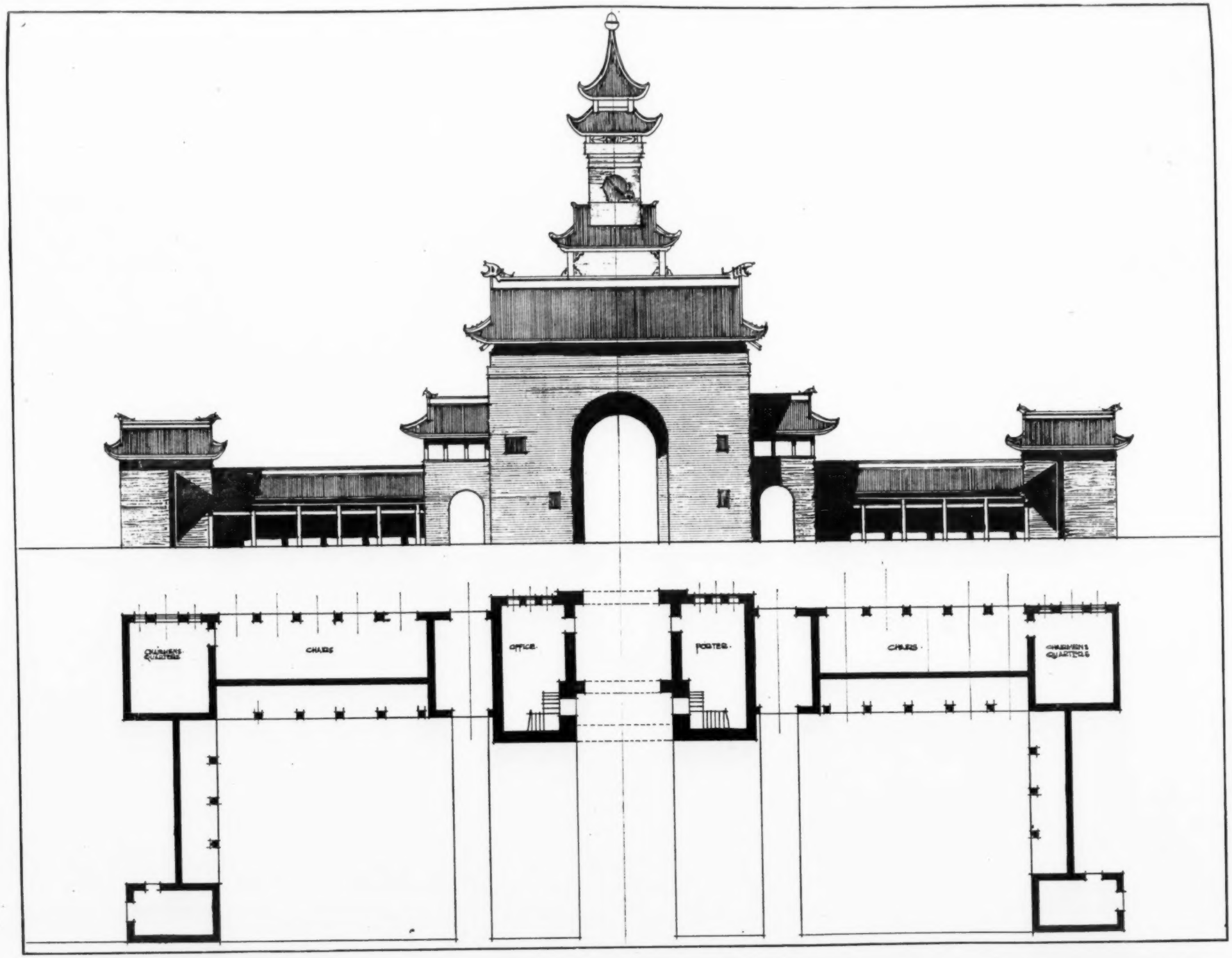
MESSRS. TREHEARNE & NORMAN, Architects.



Nos. 55-64, Strand, W.C.

MESSRS. YATES, COOK & DARBYSHIRE, Architects.

[The above drawing shows the proposed re-building of this block of premises. Half the site is to be occupied by the Saxone Shoe Co., Ltd., and the remainder of the site has been taken by Mr. F. G. Minter, building contractor, for development. Mr. Minter will be entrusted with the re-building of the whole block, but no sub-contracts have yet been let as the scheme is in its preliminary stages. An attempt has been made in designing the elevation to maintain the character and spirit of this part of London, made so famous by the Adam Brothers when they rebuilt the Adelphi. This forms part of the important Strand widening which is being carried out by the London County Council, and is immediately westward of the new "Tivoli" building which was lately opened. The new frontage line will coincide with that of the "Tivoli" building, and it is anticipated that when the widening of the Strand is extended down to Charing Cross Station the present congestion of traffic in this busy thoroughfare will be lessened.]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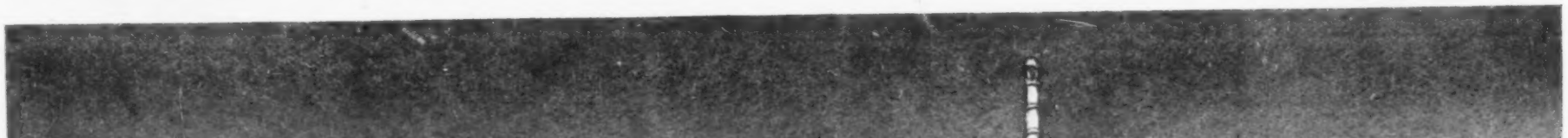
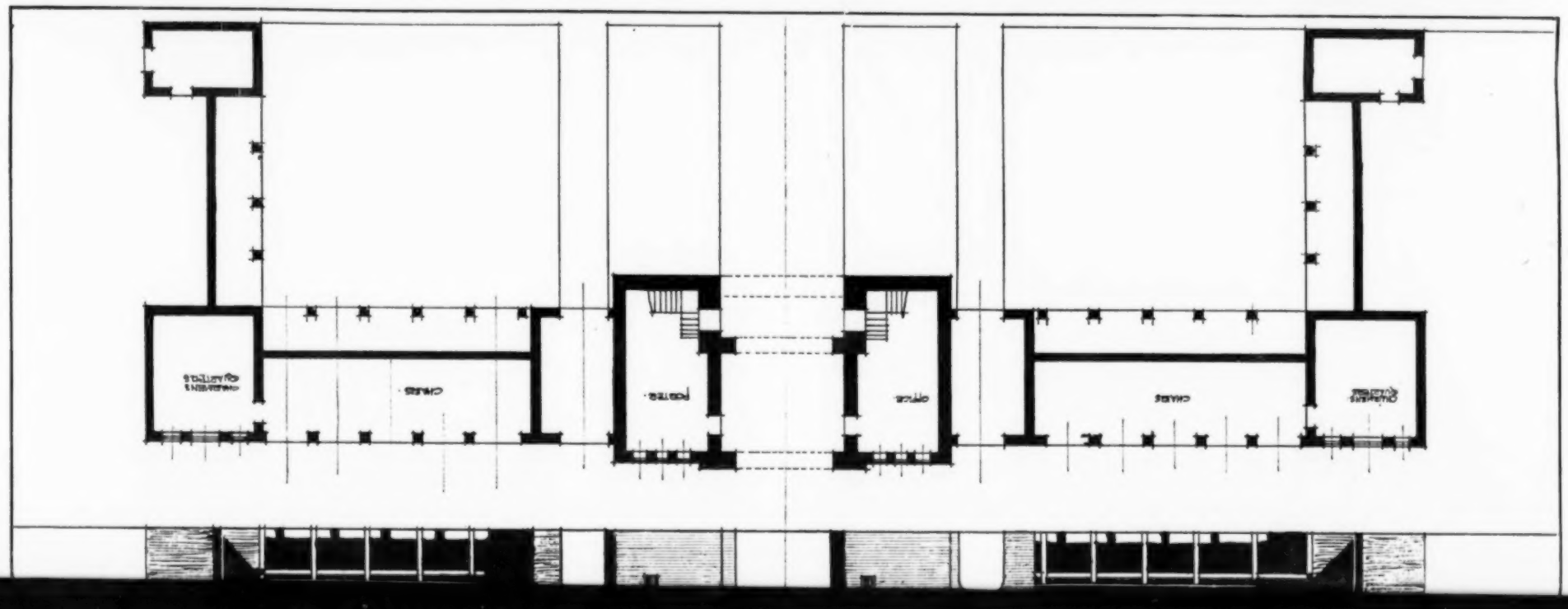
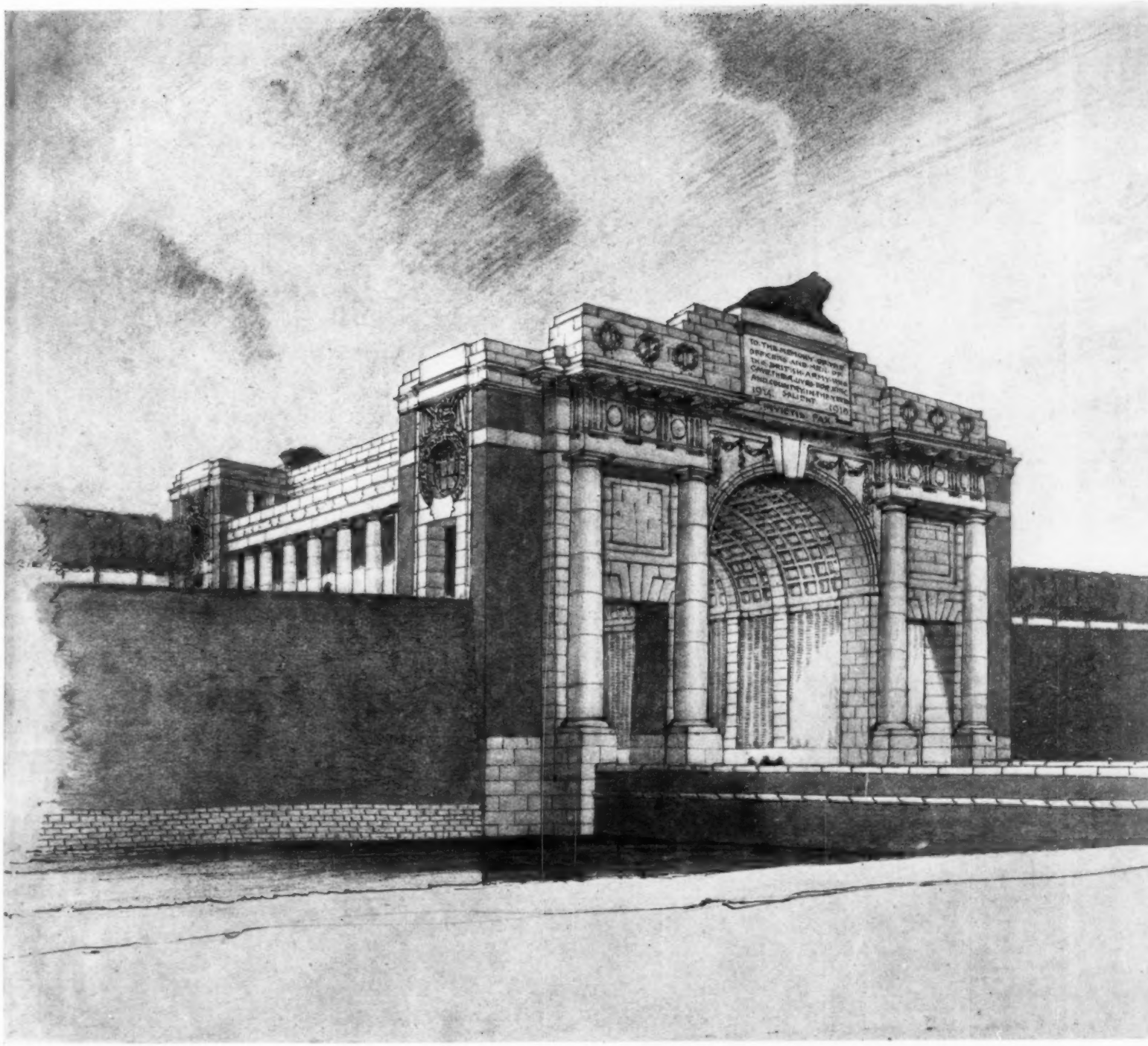




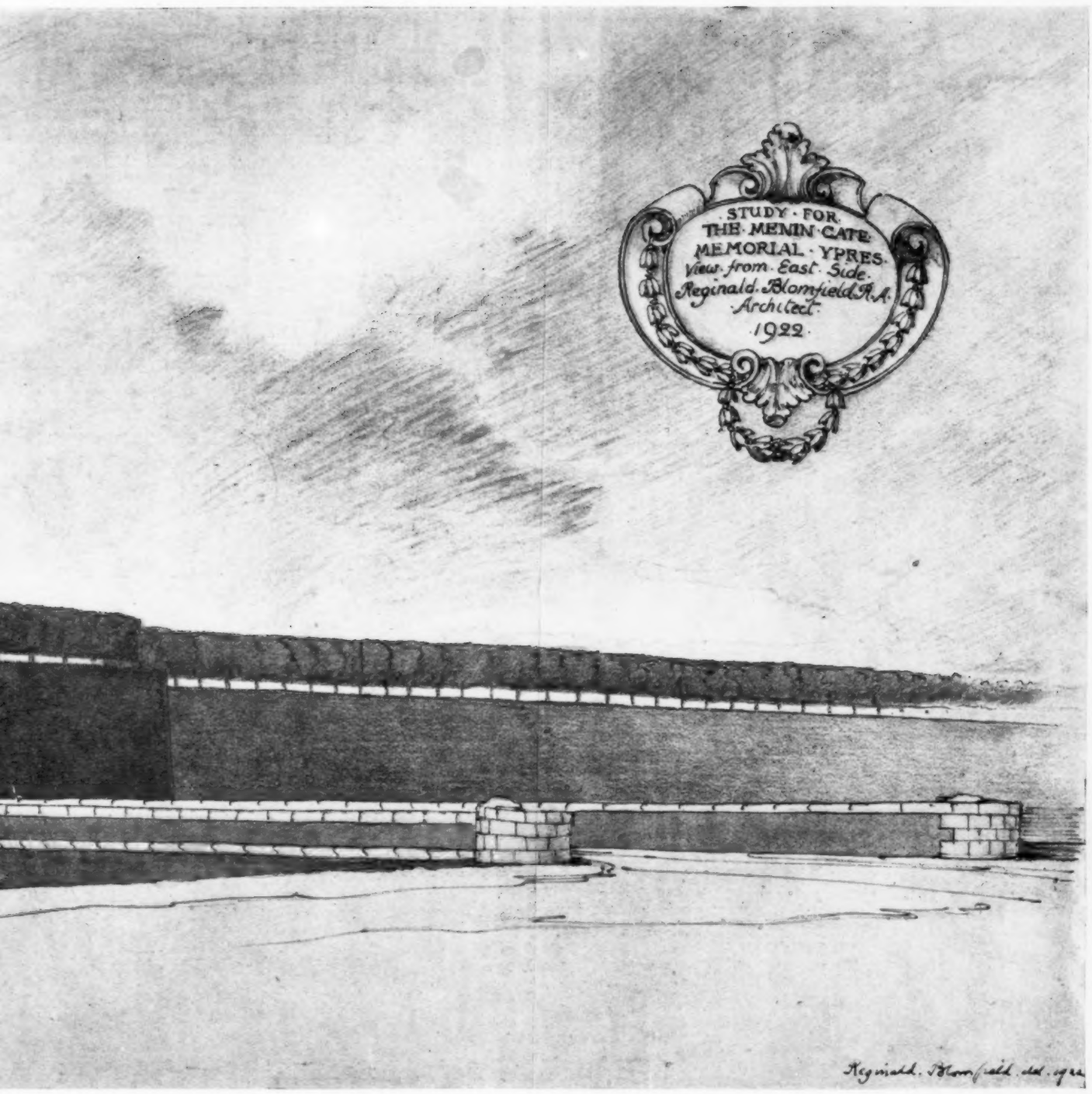
West China Union University: Main Entrance Gateway and Clock Tower. MESSRS. FRED. ROWNTREE & SONS, Architects.

UNIV. OF MICH.



Memorial to the Missing, The Menin Gate, Ypres. SIR REGINALD

Memorial to the Missing, The Menin Gate, Ypres. SIR REGINALD B



EGINALD BLOMFIELD, R.A., Litt.D., Architect.

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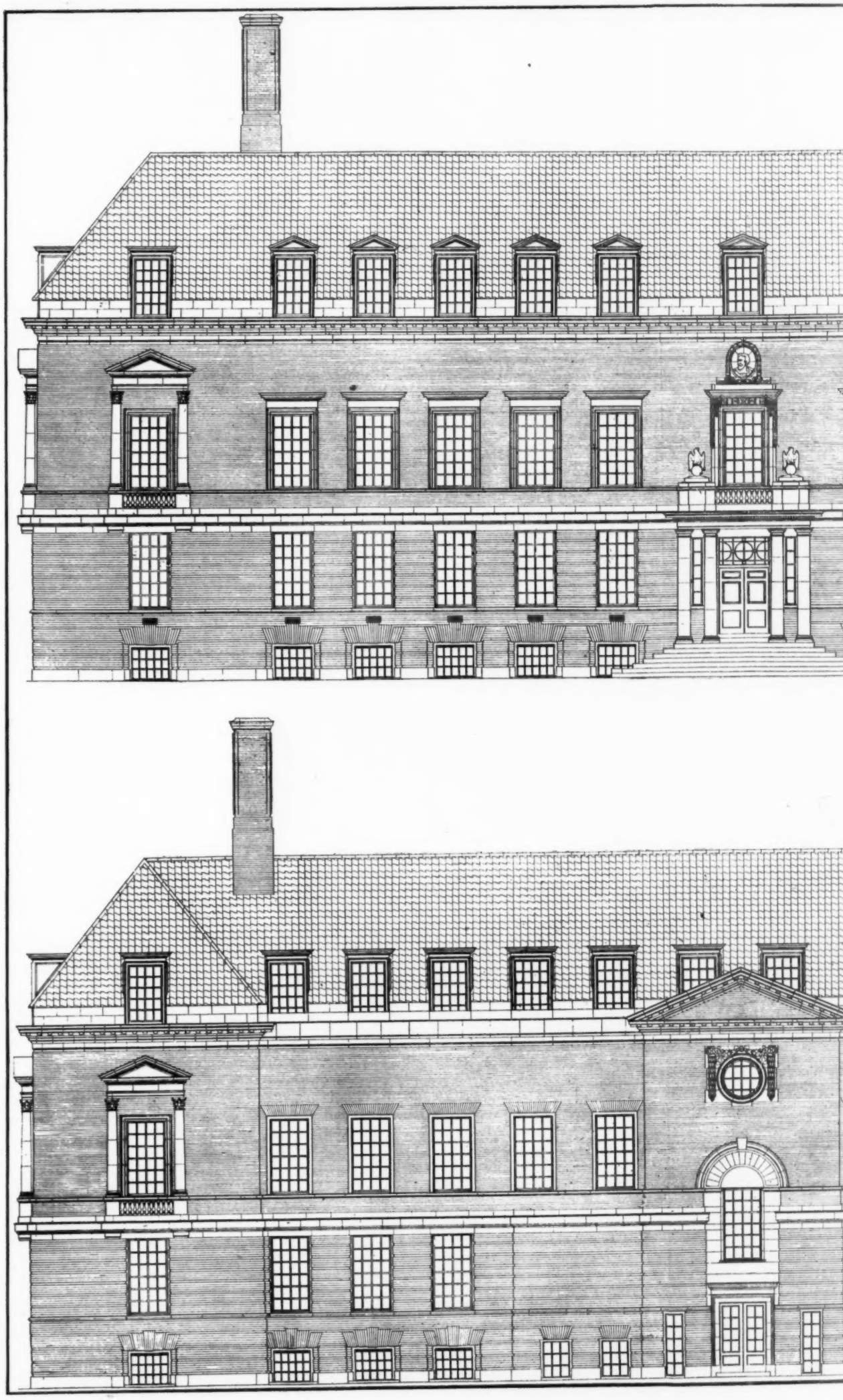

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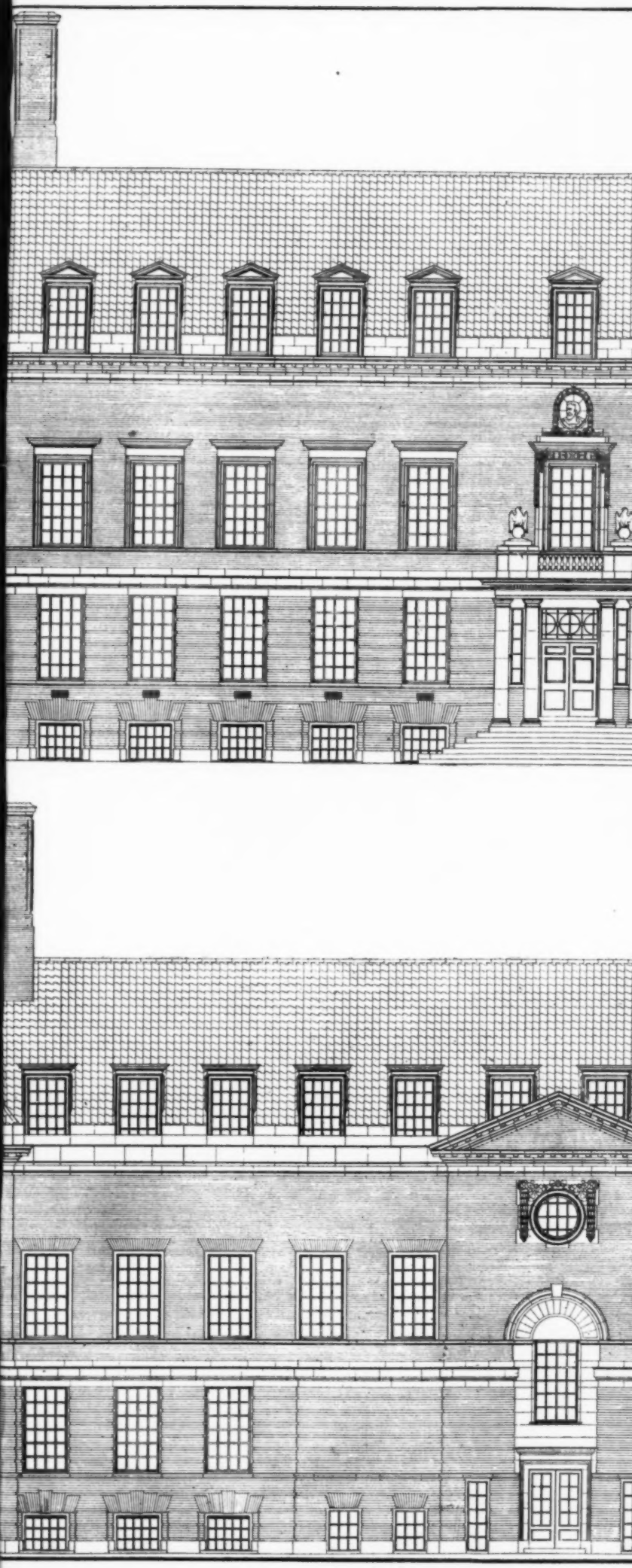

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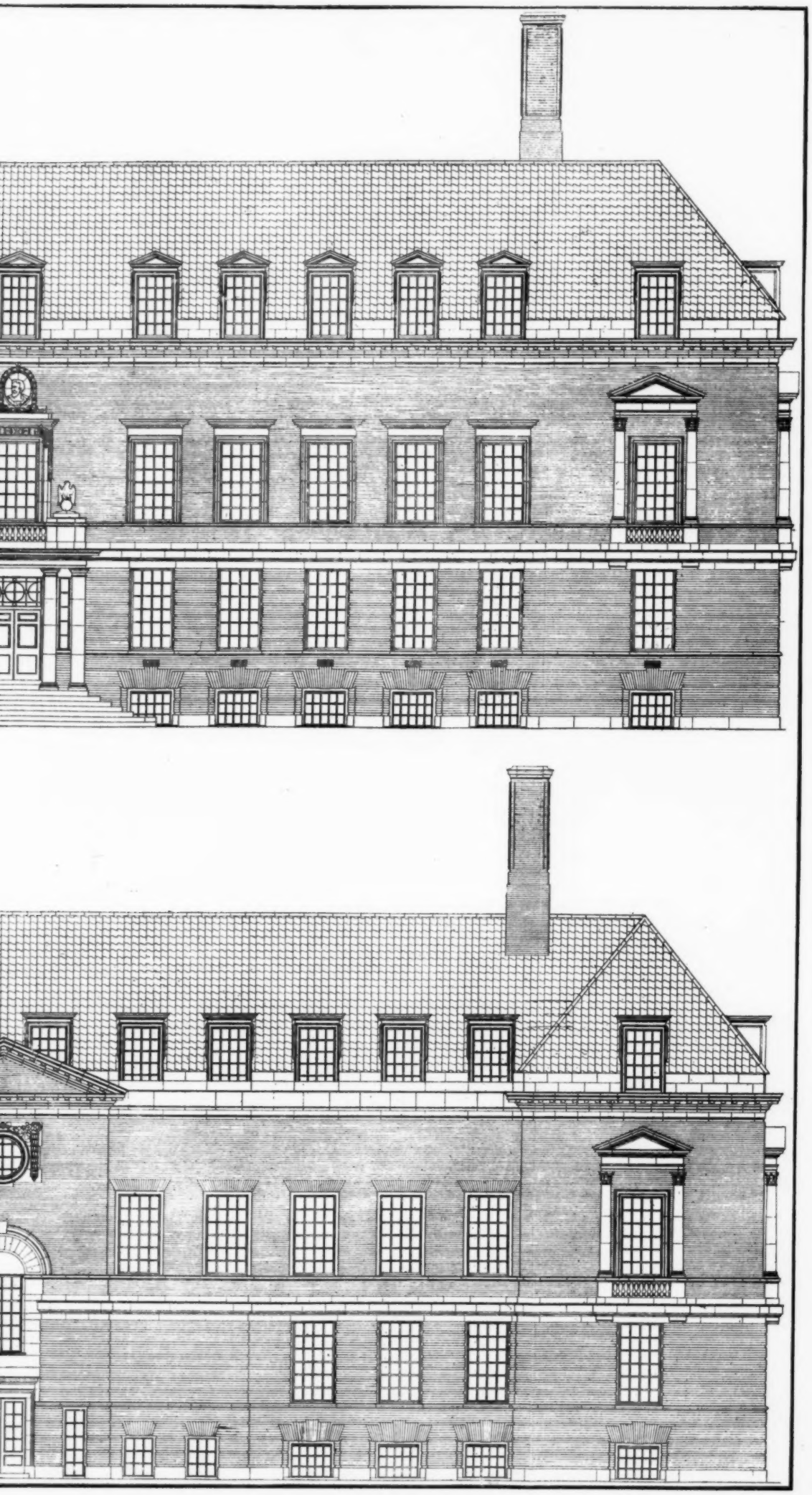

nistry. Sir Edwin Cooper, F.R.I.B.A., Architect.

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47-57, GRESHAM STREET, AND 22-26, WOO

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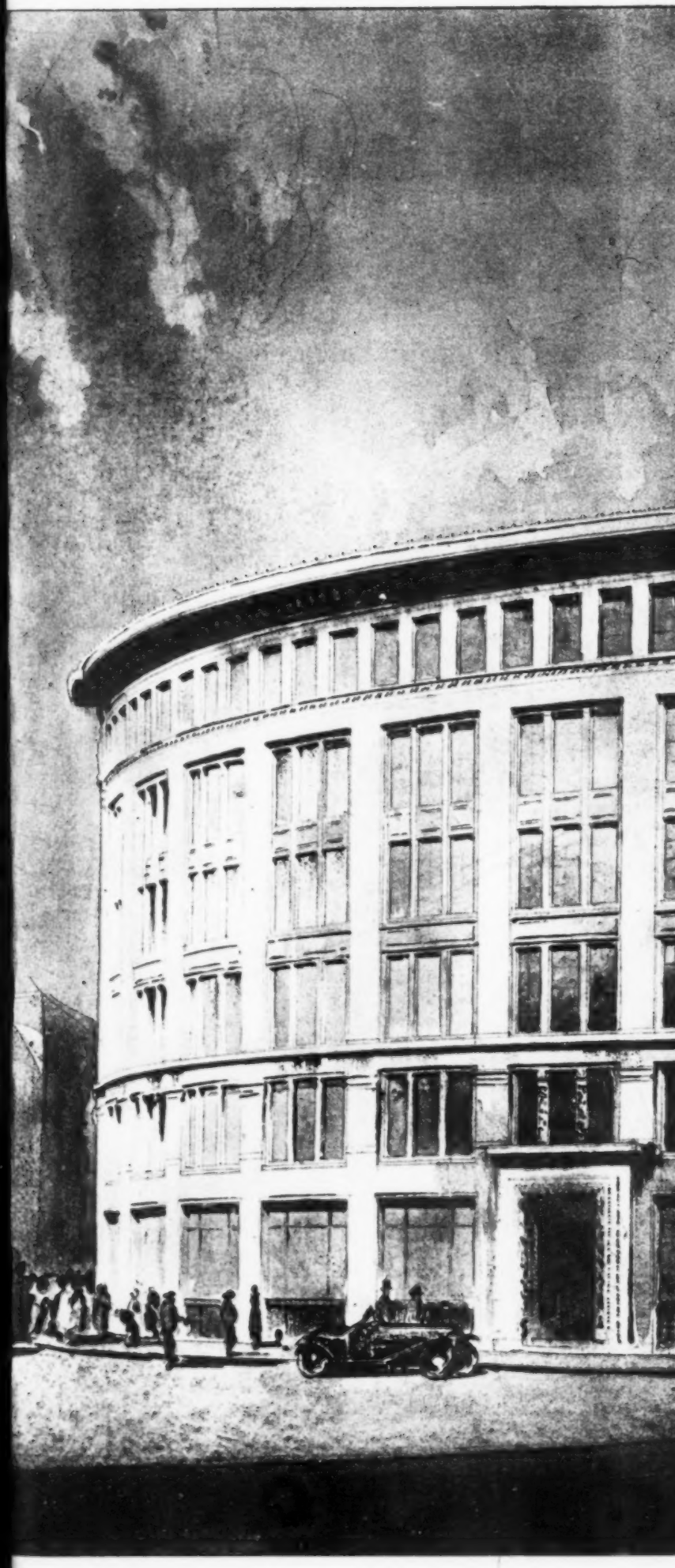

47-57, GRESHAM STREET, AND 22-26

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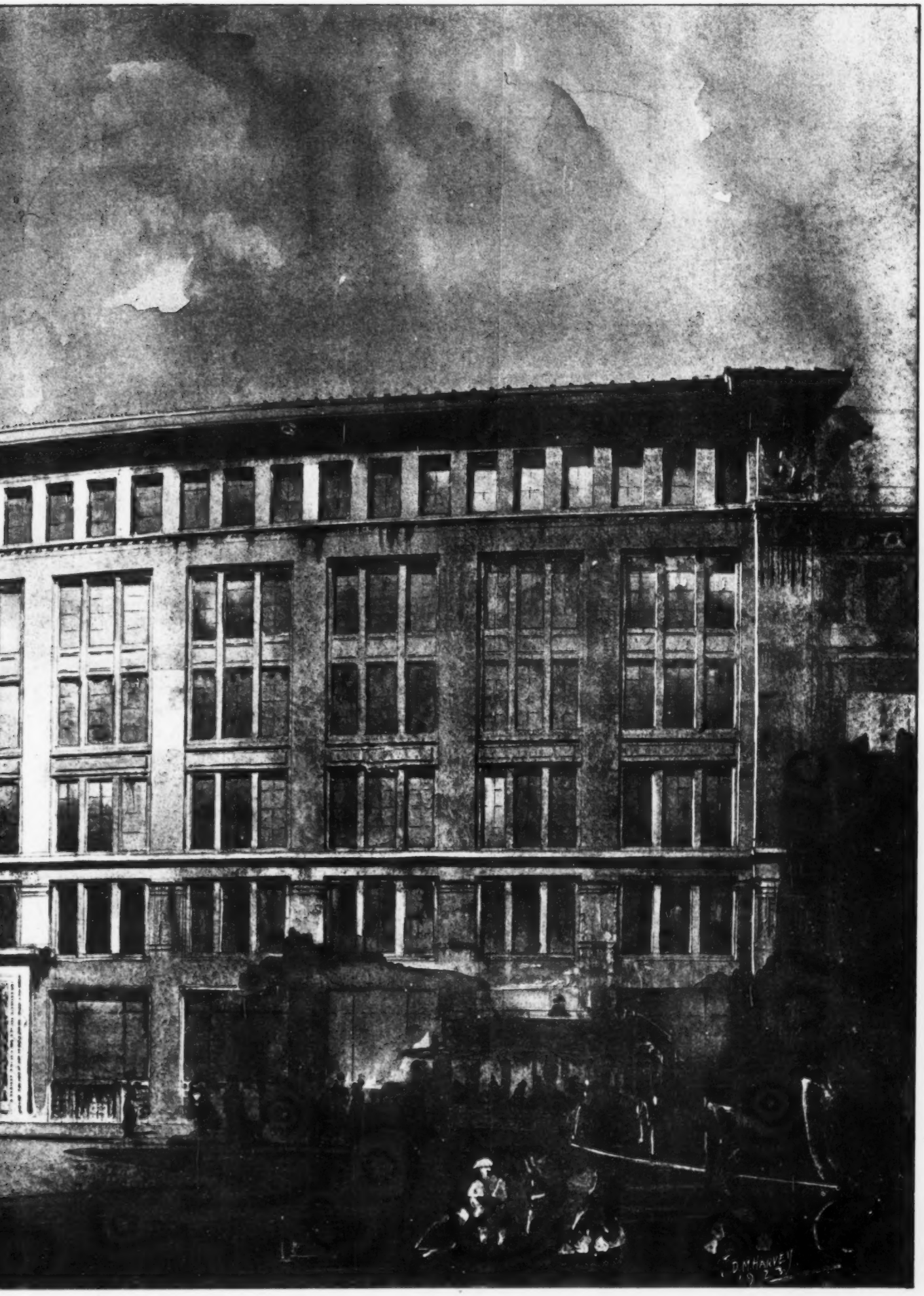

AND 22-26, WOOD STREET, E.C.

ILL, FF.R.I.B.A., ARCHITECTS.

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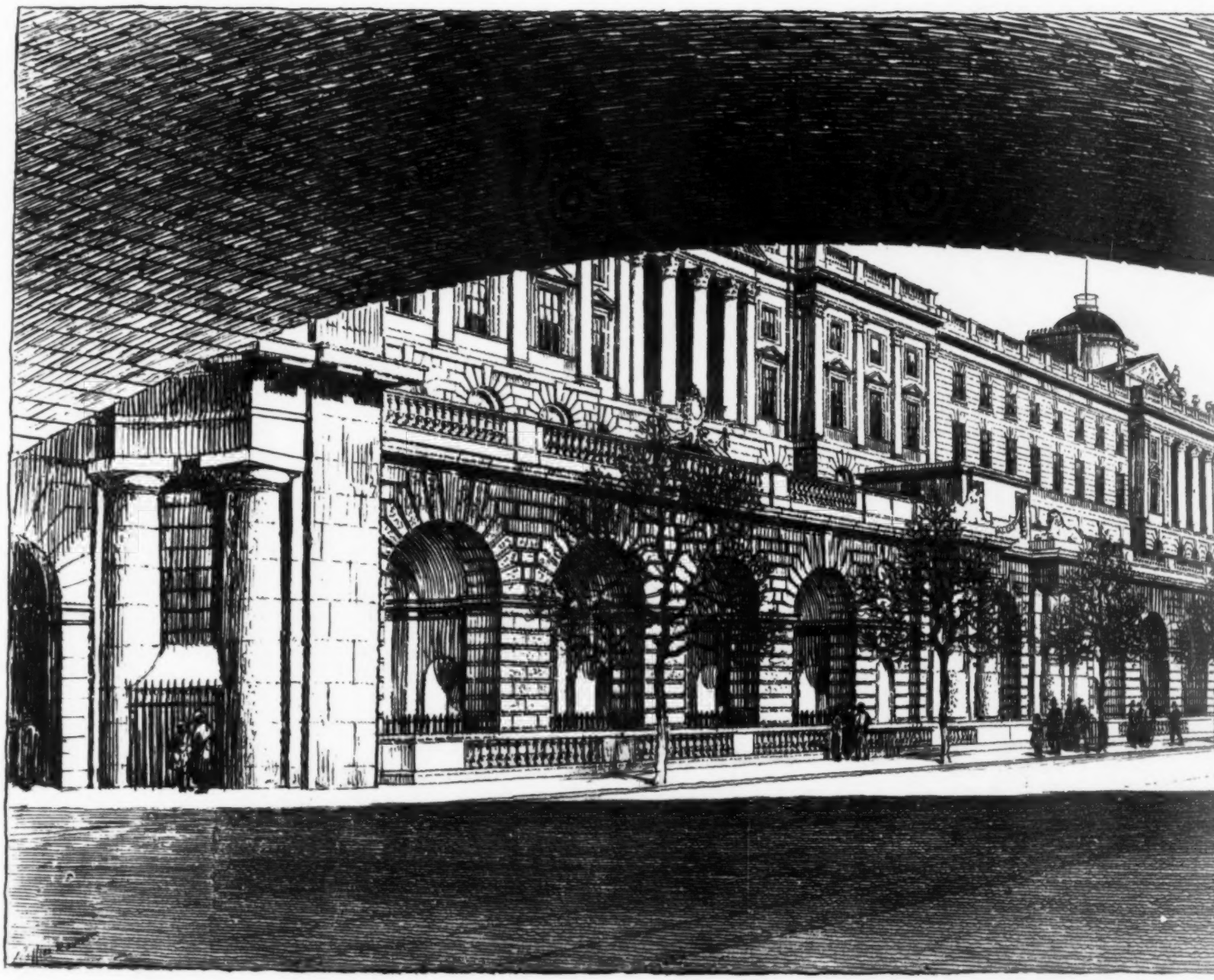
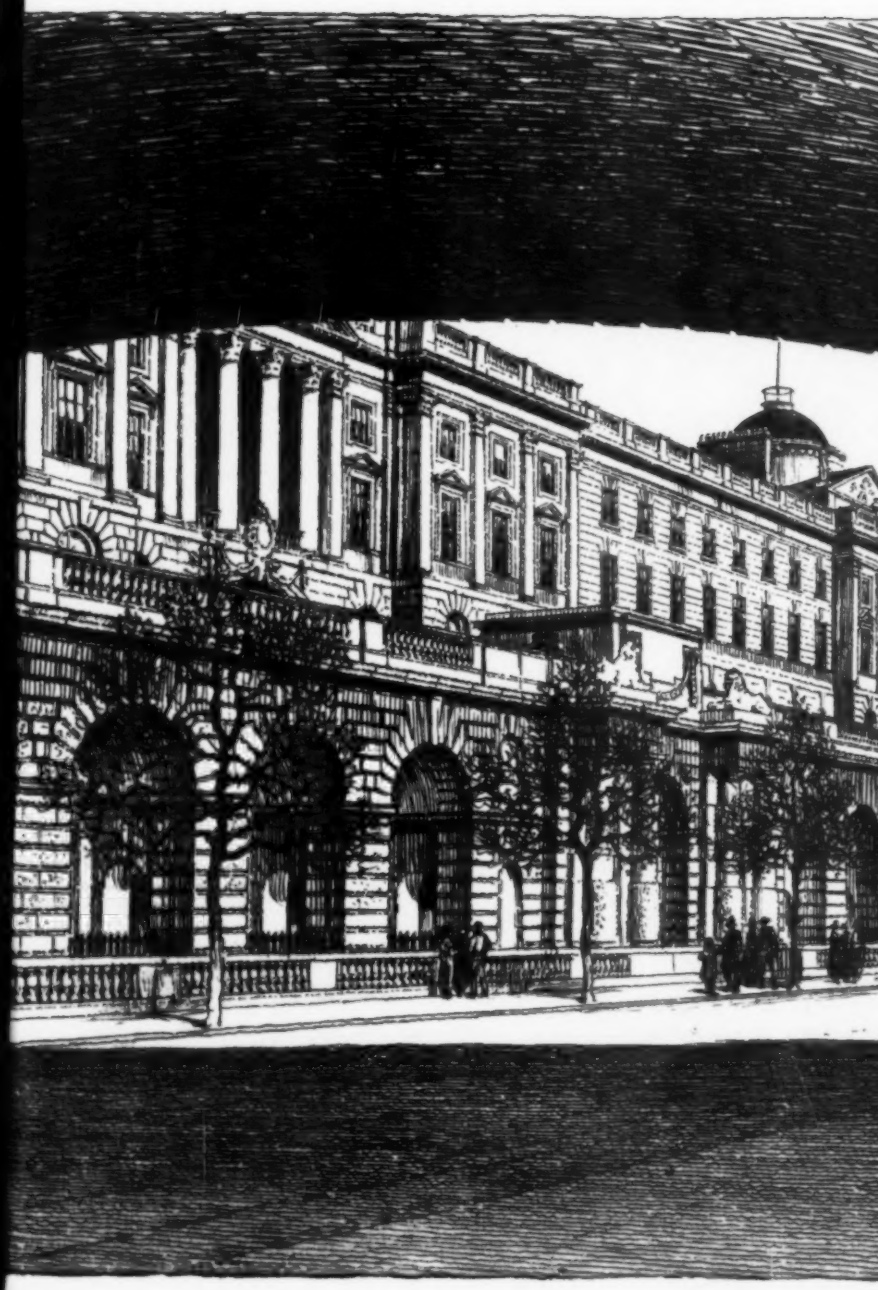


A LONDON VISTA: SOMERSET HOUSE, FROM A DRAWING BY MR. T. RA



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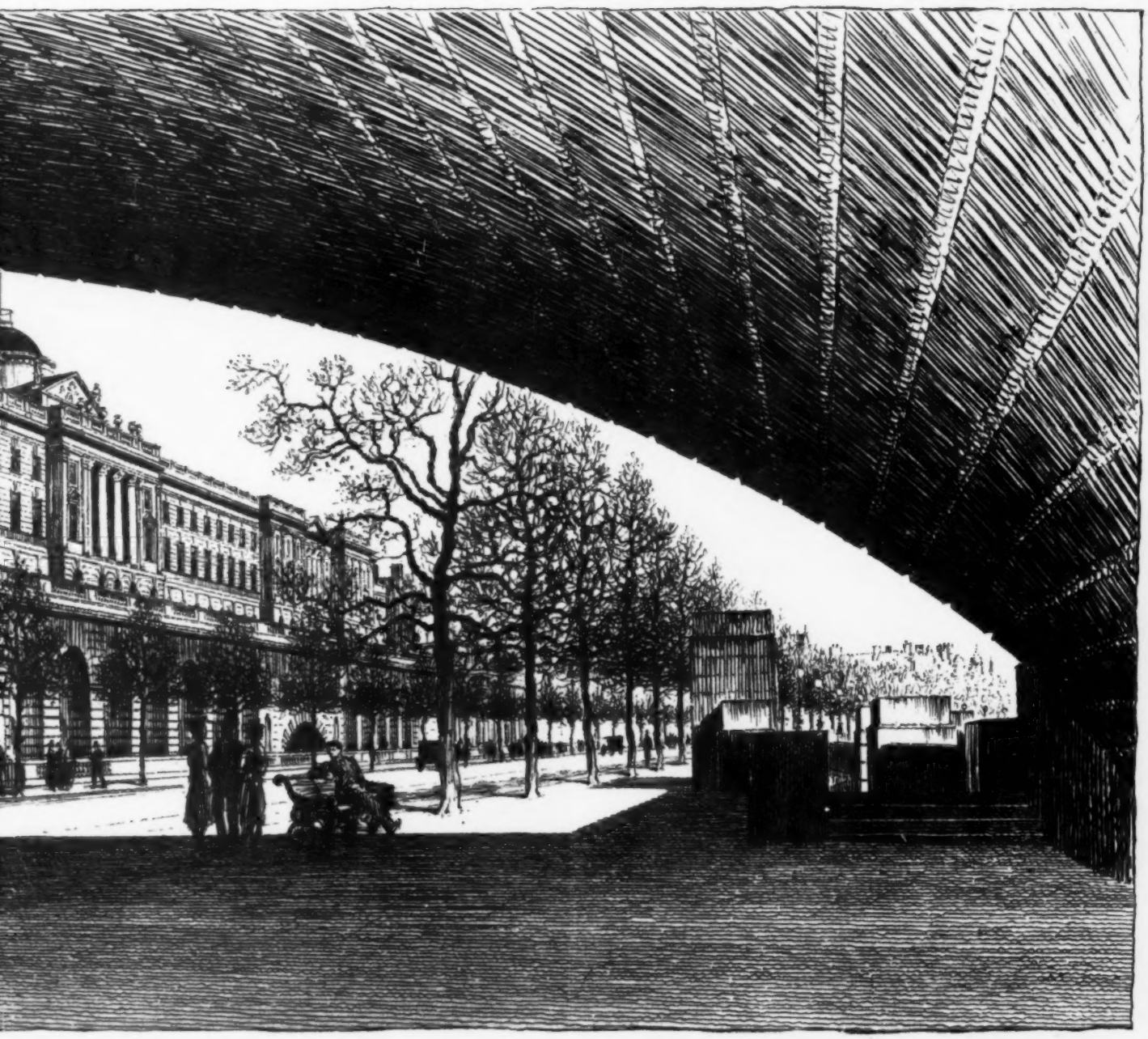

ING BY MR. T. RAFFLES DAVISON, HON. A.R.I.B.A.

The Builder Ca

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PARDON CHURCH AND CL

In the north-west corner of St. Paul's Churchyard stood a Chantry Chapel, founded by Gilbert Becket (father of Thomas à
the reign of Henry V. On the wall of the Cloister may be seen the "Dance of Death" painted upon it in the reign

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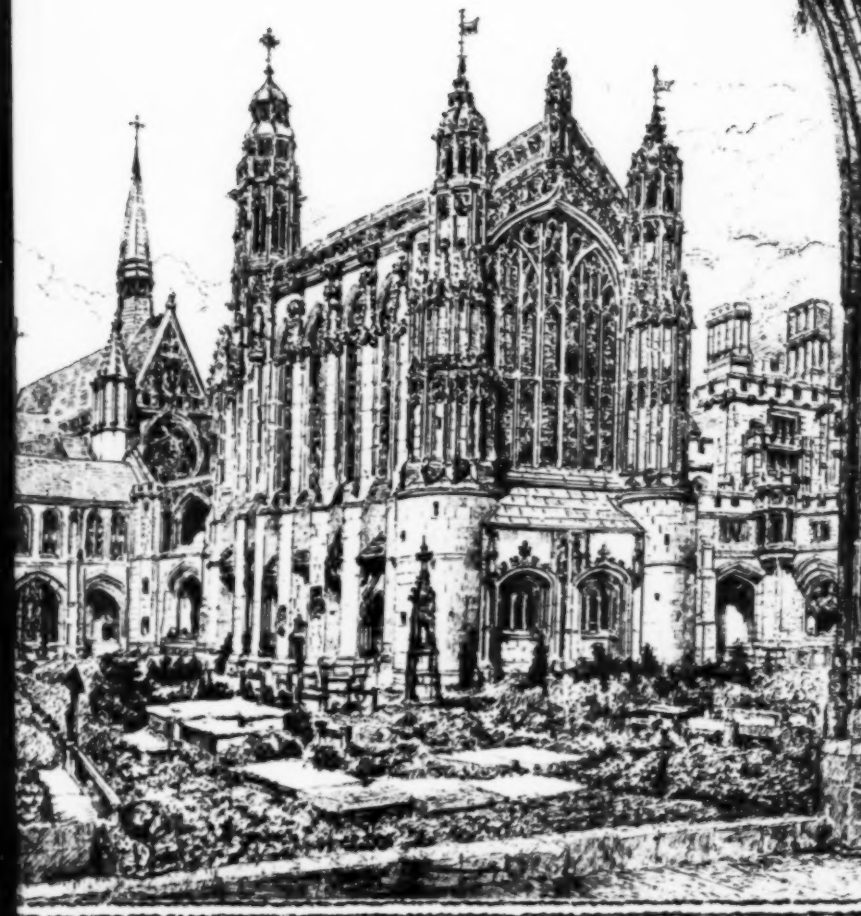

PARDON CHURCH AN

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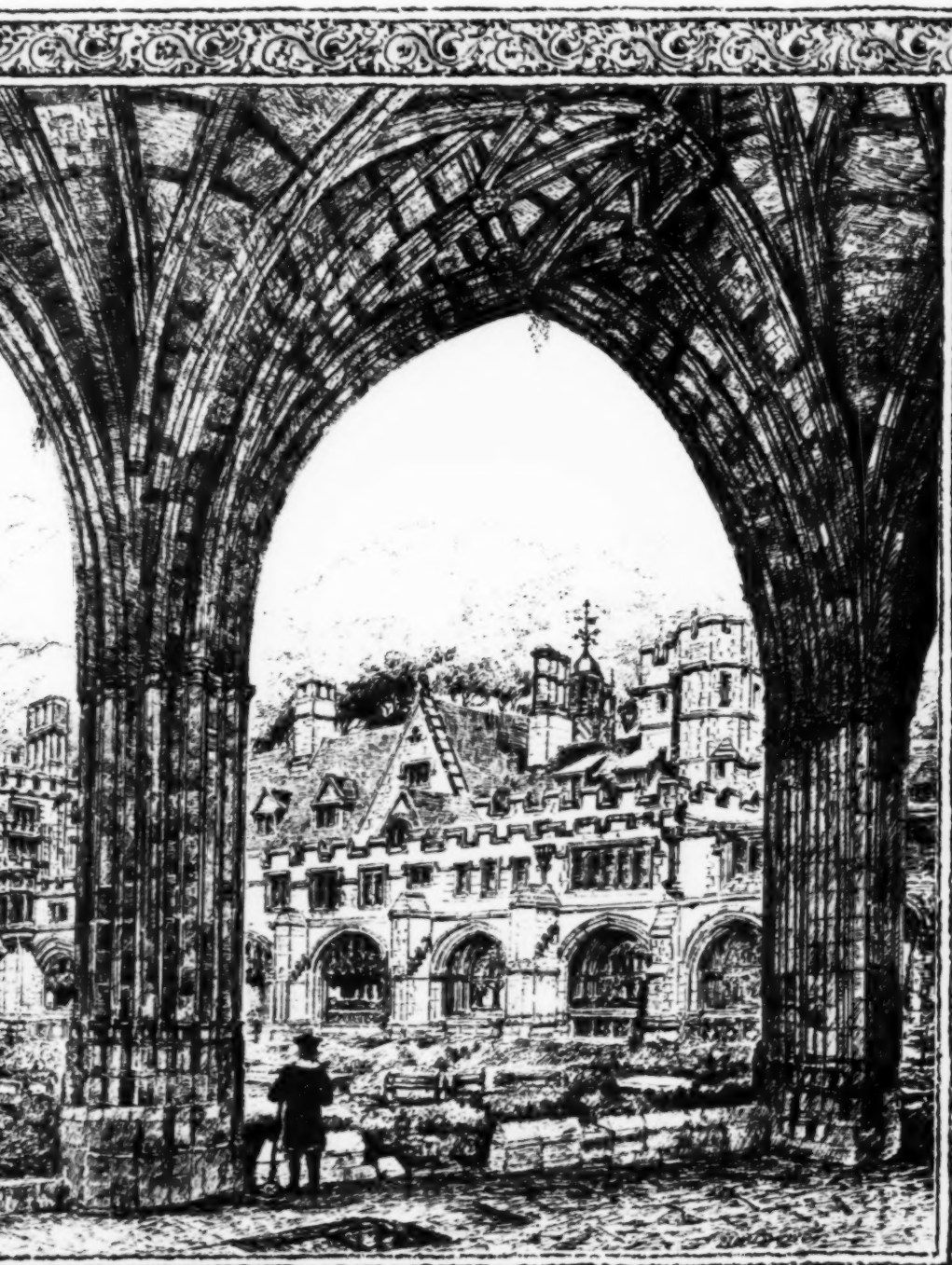
Calendar 1924



CH AND CLOISTERS.

(father of Thomas à Becket) in the reign of King Stephen, and called "Pardon Church" It was rebuilt in
d upon it in the reign of Henry VI. The houses of Paternoster Row appear above the Cloister wall.

July

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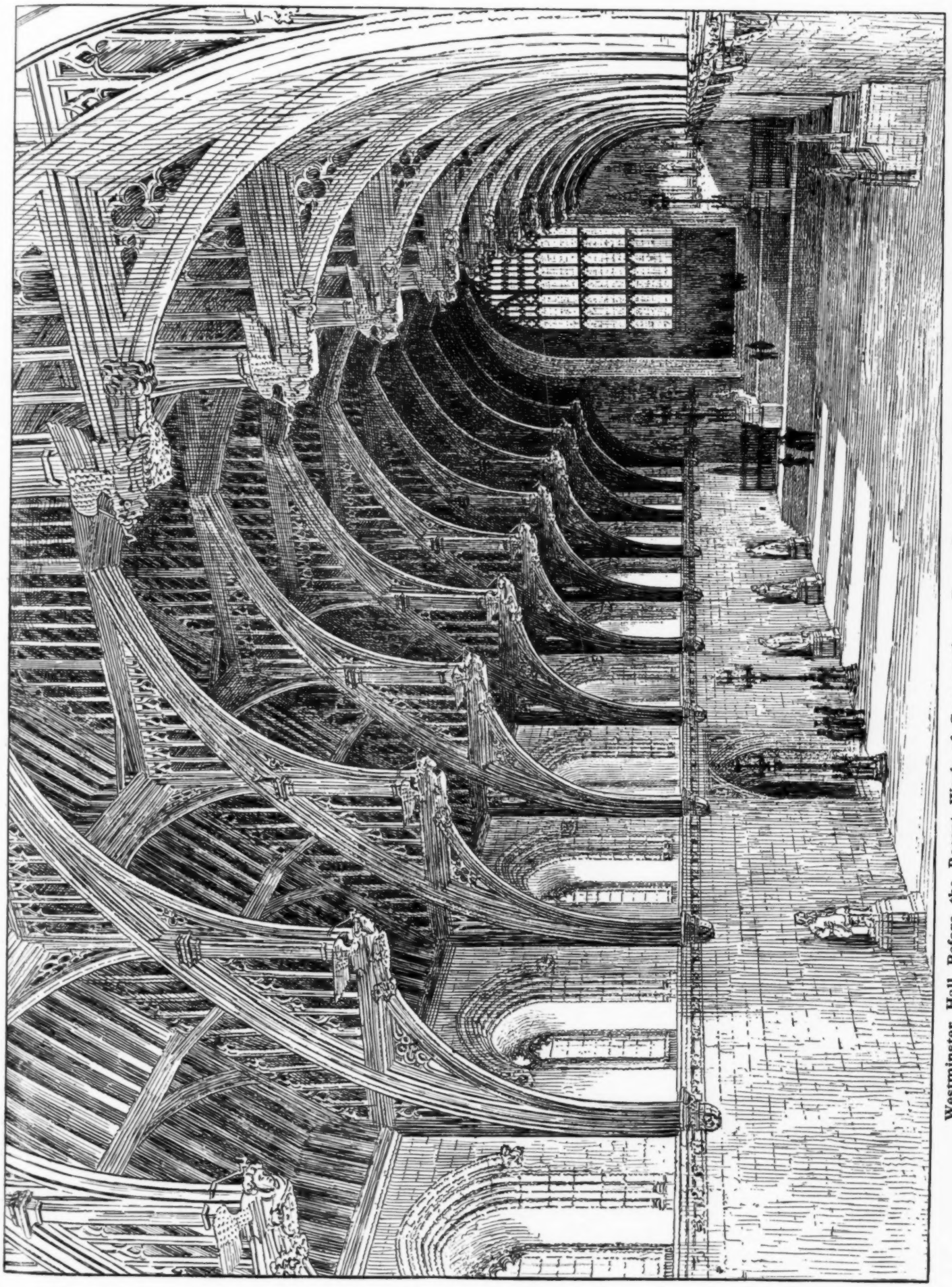
UNIV. OF MICH.



Westminster Hall Before the Recent Work of Conservation. From a Drawing by Mr. T. Raffles Davison, Hon. A.R.I.B.A.

THE JEWEL TOWER, WESTMINSTER.

By W. HARVEY.

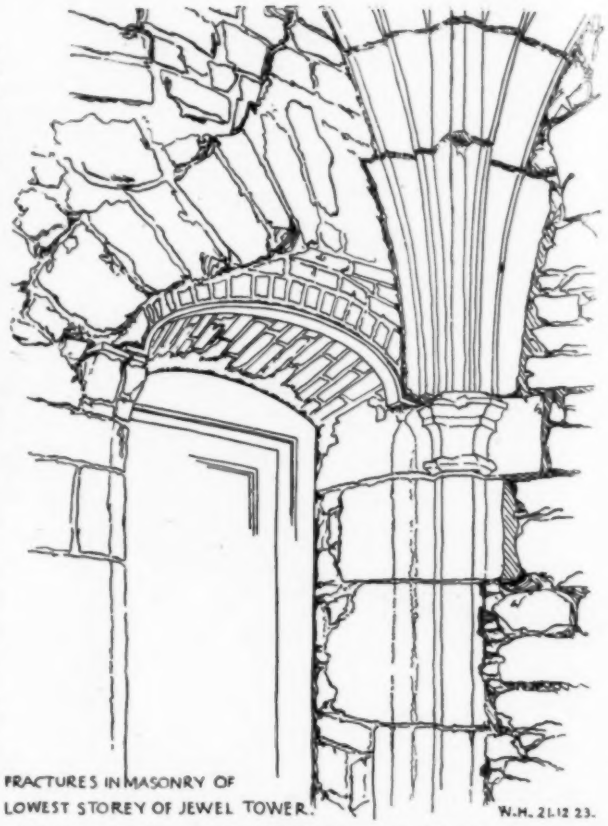
The preservation of Richard II's Jewel Tower at Westminster would be worth while were it only to keep in mind the accuracy with which Shakespeare has portrayed the character of England's most luxurious monarch. The jewelled insignia of royal state are continually referred to in his play, and the tragedy of Richard's fall is heightened by contrast with the artistic magnificence of his former tyranny. The King, who "every day under his household roof did keep ten thousand men," and who is reputed to have caused a garment for himself to be made of gold, silver, and precious stones to the value of 3,000 marks, may well have felt the need of a treasure house in which to preserve jewels obtained by his unjust and unconstitutional exactions. The charming but dilapidated building which now forms part of the Weights and Measures Office has suffered severely from decay and alteration since its original erection; but a fine chamber on the basement floor, ceiled with a ribbed vault, retains something of the sumptuous character imparted to it by its builders, who probably acted upon the express directions of their æsthetic sovereign. The chamber contains two bays of rib and panel vaulting, with level ridge-ribs meeting in grotesque carved bosses, where flowers unknown to botany merge imperceptibly into queer beasts as the spectator changes his position in looking up at them. One of the larger of these bosses (shown in the illustration) appears to be a somewhat outlandish vegetable product with four principal leaves when viewed from below, but reveals itself as a four-headed, open-mouthed monster when inspected from the side. The walls of the chamber are not very thick in proportion to the span and height of the vault, and no sign of buttresses remains upon the exterior of the building. It is not altogether safe to argue from this that none were originally provided, since the walls have obviously been repaired out of all knowledge, with windows, probably far larger than the originals, inserted in recent times.

It would be, however, quite in accordance with mediæval structural economy to dispense with buttresses where the vault of a ground story chamber was to be abutted by continuous solid walls supplied with the plentiful top weight of an upper story. Top weight may be made to modify the direction of an arch thrust, although, as was pointed out in Chambers' Cyclopædia of 1783, this function is only performed in ideal perfection when the top weight is infinitely great.

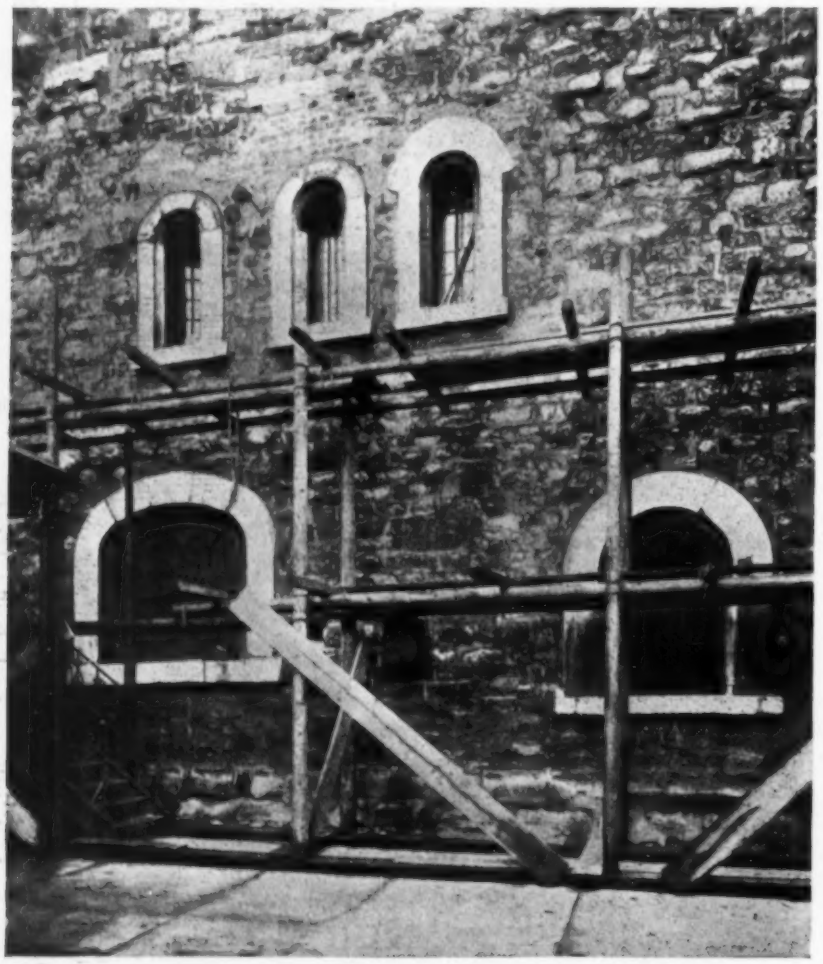
Notwithstanding the spread of cyclopædic knowledge and the growth of theoretical science, a rash experiment of comparatively recent times came near to overthrowing the whole tower. At some unrecorded date, but sufficiently recent to be described by Sir Gilbert Scott as "modern," the ground-floor chamber above the Gothic vault was also provided with a stone ceiling. This was given the form of a low elliptical intersecting barrel vault of plain ashlar set in mortar.

The tooling of the stonework resembles that of some repairs to Westminster Hall executed under the direction of Sir Robert Smirke in 1834, and, failing a more accurate figure, this date may be provisionally accepted for the construction of the ground-floor vault.

Long before the time of Sir Robert Smirke the theory of arches and vaults had already received the attention of scientists, Sir Christopher Wren himself having left a short tract on the subject; but as words were multiplied, practical good sense seems to have disappeared, and it is a remarkable fact that the use of the arch as a normal feature of ordinary utilitarian building construction was most common before the discovery of the principle of Catinaria. At the Jewel Tower theoretical knowledge seems to have been a poor substitute for the practical experience that comes readily to those who are working in the main current of a living tradition. The height of the new vault from the ground was a factor which should have been taken into consideration, but no special devices were employed to mitigate the damaging outward pressures of the vault, which naturally act with worse effect when applied at a high point than at a low one, since their leverage is increased in respect to the point of application of those forces by virtue of which all buildings stand—the pressures of the soil upon the foundations. The old walls, built, as was usual in Gothic times, of a facing of ashlar with an internal core of rather indifferent rubble, began to yield to the strain. A second story above the new vault supplied enough top weight above the points of application of the vault springers to stave off immediate collapse, but the walls bowed out and became riddled with a network of cracks, showing themselves as faint lines in the ashlar facings and as horrible cavities in the disintegrated internal core. Matters were by no means improved by the heavy loads placed upon the floor, which had been laid upon the upper surface of the vault and the lime concrete filling of the vault pockets. The upper chambers of the tower were used as a place for the storage of standard measures, generally made of ponderous metal. The repairs of the structure were postponed from time to time to suit the occupation of the building by the Weights and Measures Department, and it



Part of Internal Walling and Vault Springer, with Modern Brick Patching and Serious Fractures before Present Repairs.



The Walls are Riddled with a Network of Cracks. Even the Voussoirs of the modern Windows Show Signs of Movement.

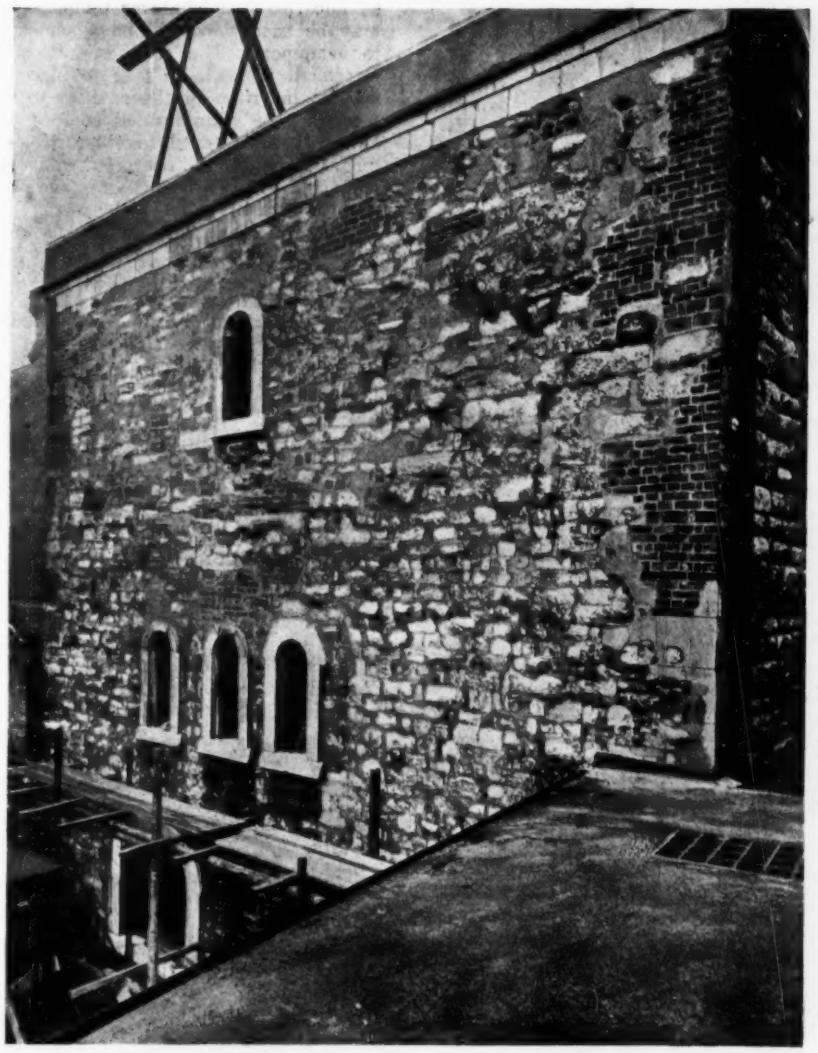
was only upon renewed signs of movement in the bulging walls and the dangerous displacement of stones in the modern vault that the work of preservation was at length taken in hand.

Critics often express a wish that the buildings "might be left alone and allowed to remain just as they are," and this postponement of repairs long known to be necessary should indicate that in this instance repairs have not been applied without very careful consideration.

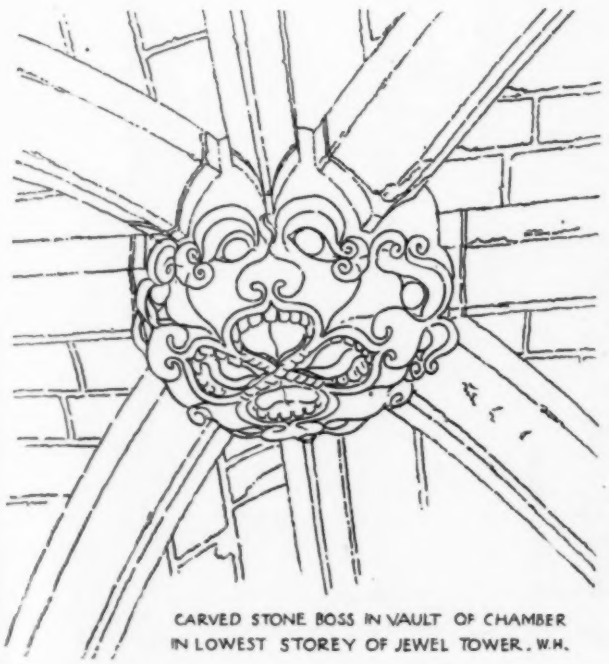
System and routine are in evidence in the methods of the conservators, but they are of such a nature as no sane man need find objectionable. Certain rules are indeed invariably applied, and each building is subjected to minute scrutiny, with the view of discovering the cause as well as the symptoms of its decay, in order that the best and most lasting cure by the least conspicuous means may be devised and put into operation. What shall be done to the building is only determined in the light of a full inquiry into its present condition and historical defects.

These inquiries are often highly interesting in a structural and historical sense, since the strength as well as the weakness of ancient work is brought into prominence in a manner impossible to casual inspection. A trial hole excavated at the north-west angle of the building to determine whether some part of the decay in the shattered walls might not have been due to imperfect foundations revealed an exceptionally sound footing upon a bed of rammed chalk superimposed upon the heads of elm piles 5 ft. in length. The heads of the piles are nearly 12 ft. below the present ground level, and, except for a thin layer of water-soaked fibres, the wood appeared to be in thoroughly sound condition. The piles were round logs driven in close contact with one another in the Thames mud. It was decided that the foundation was probably sound and should be left alone, and that the defects were due to the feeble and composite nature of the walls and their core, in which dust and chalk predominated, and to the bursting action of the two superimposed vaults.

The lines on which works of repair should be designed were clearly indicated by the state of the building itself, and it was, therefore, proposed to make the defective walls as nearly monolithic as possible by a process of cleaning, grouting, tamping, and pointing applied from both faces, and to restrain the outward thrust of the upper vault by the insertion of a system of reinforced concrete beams and ties above its crown, and designed ultimately to form part of a reinforced concrete floor to the uppermost chamber. Works were commenced in the lower part of the building, and the principal or Gothic vault and its supporting walls have now been satisfactorily treated without mishap. Upon the erection of a scaffold about the building public interest and vigilance were immediately demonstrated by a protest from some friendly critics, who prayed that the present patched and "picturesque" appearance of the walls might be preserved. These critics seem to have ignored the structural problems involved in maintaining the vaults in equilibrium, and to have judged the whole case from the point of view of a single factor, namely, the external appearance of the building.



Though Considered Picturesque by Some Observers, the Brick and Tile Patchings are being Replaced by Sound Old Stone Bonders to give Strength to the Shattered Walls.



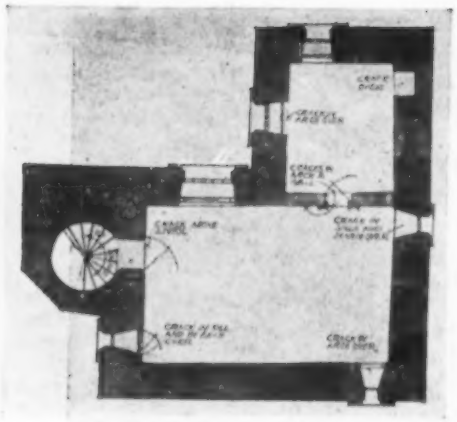
CARVED STONE BOSS IN VAULT OF CHAMBER IN LOWEST STOREY OF JEWEL TOWER. W.H.

The Vault has now been made Secure without Alteration to the Appearance of the Stonework.

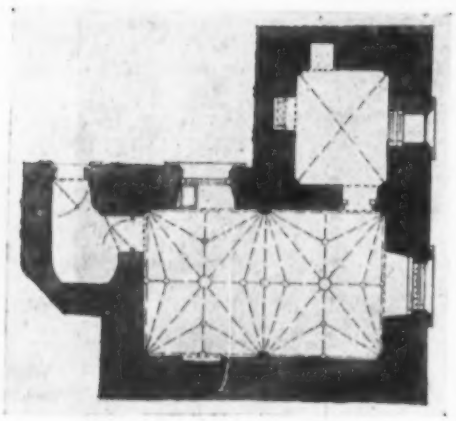
Such criticism is, indeed, far more valuable than crass indifference, and calls attention to certain aspects of the case, but it was not in this instance constructionally helpful, nor did it take into account the fact that in architecture appearance must go hand in hand with structural soundness if satisfactory results are to be achieved. It is doubtful, too, whether the advice to preserve the modern patches of tiles and bricks on edge and daubs of cement rendering could have been acted upon. Many of these extraneous additions to the decaying surface of the wall were themselves on the point of coming adrift, and could be shifted bodily with a touch of the hand, revealing again the old cavities they had been applied to conceal rather than to repair.

They are, perhaps, no worse than a great many other superficial patchings that have been executed on ancient buildings in other parts of the country, but they were in all probability put on only in the hope of keeping off the rain for a year or two until something better could be put in hand. Nothing would have been farther from the thoughts of the users of the last generation who dubbed on the patches of tiles than that their hasty bit of botched work should, in the course of fifty or sixty years, meet with blessing and approval from this generation.

The suggestion was nevertheless given careful consideration by the Historic Buildings Branch, but the state of the structure ruled it out as impracticable. Wherever fractures and cavities are found to be too bad for treatment with the existing stones and internal grouting a few old stones of similar character, obtained from demolished buildings, have been inserted as bonders so as to strengthen what were formerly the weakest parts of the wall. The insertion of the reinforced beam above the level of the upper vault will be a more difficult and hazardous operation, but the stability of the upper part of the wall will be guaranteed by the erection of heavy raking shores before the excavation for the beam is undertaken, and the work above the beam will also be consolidated in



FIRST-FLOOR PLAN.



BASEMENT PLAN.

advance, so that whatever temporary supports may be used they will have something solid to act upon. The steel work for the reinforcement is made to take to pieces for convenient insertion in the cavities to be groped for it in the disintegrated core of the walls, and will be fastened together in position by means of special overlaps and fishplates, which will be left free of concrete for the purpose until the steel work has been thoroughly connected. The use of the tie-bars passing across the building to uphold the slipping stones of the vault and to form part of a reinforced concrete floor is worthy of note. The material is not only used economically, but the modern repair is adapted to the ancient work in a way that avoids, as far as may be, the well-known fate of new patches in old garments—a fate that was too well illustrated by the former fragmentary repairs.

In case any doubt remains as to the necessity of the work being put in hand it should be stated that the stones of the upper vault were slipped out of line to the extent of 1½ in. Gaping cracks occur in the masonry of every corner of the building, and when one of the picturesque patches of modern tilework is struck with the fist showers of dusty *débris* run down the face of the work from fissures a yard or more away from the spot. The condition of the basement chamber, with its Gothic vault, where part of the work is finished and part remains in its old dilapidated state, is excellent evidence of the artistic reticence and discretion, as well as the workmanlike execution, of the present repairs.

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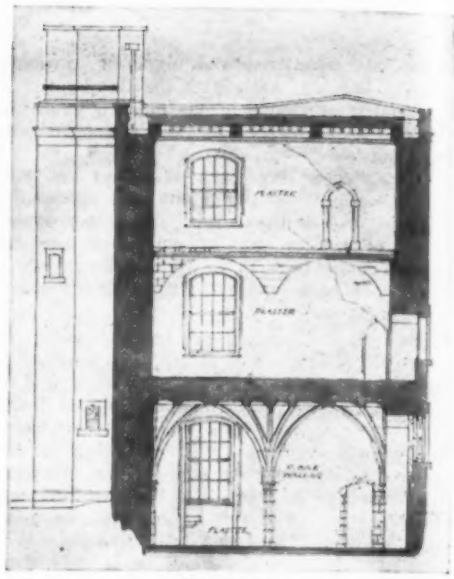
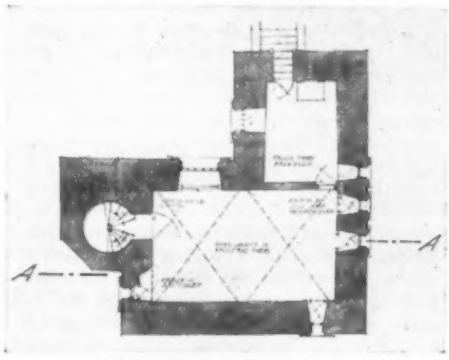
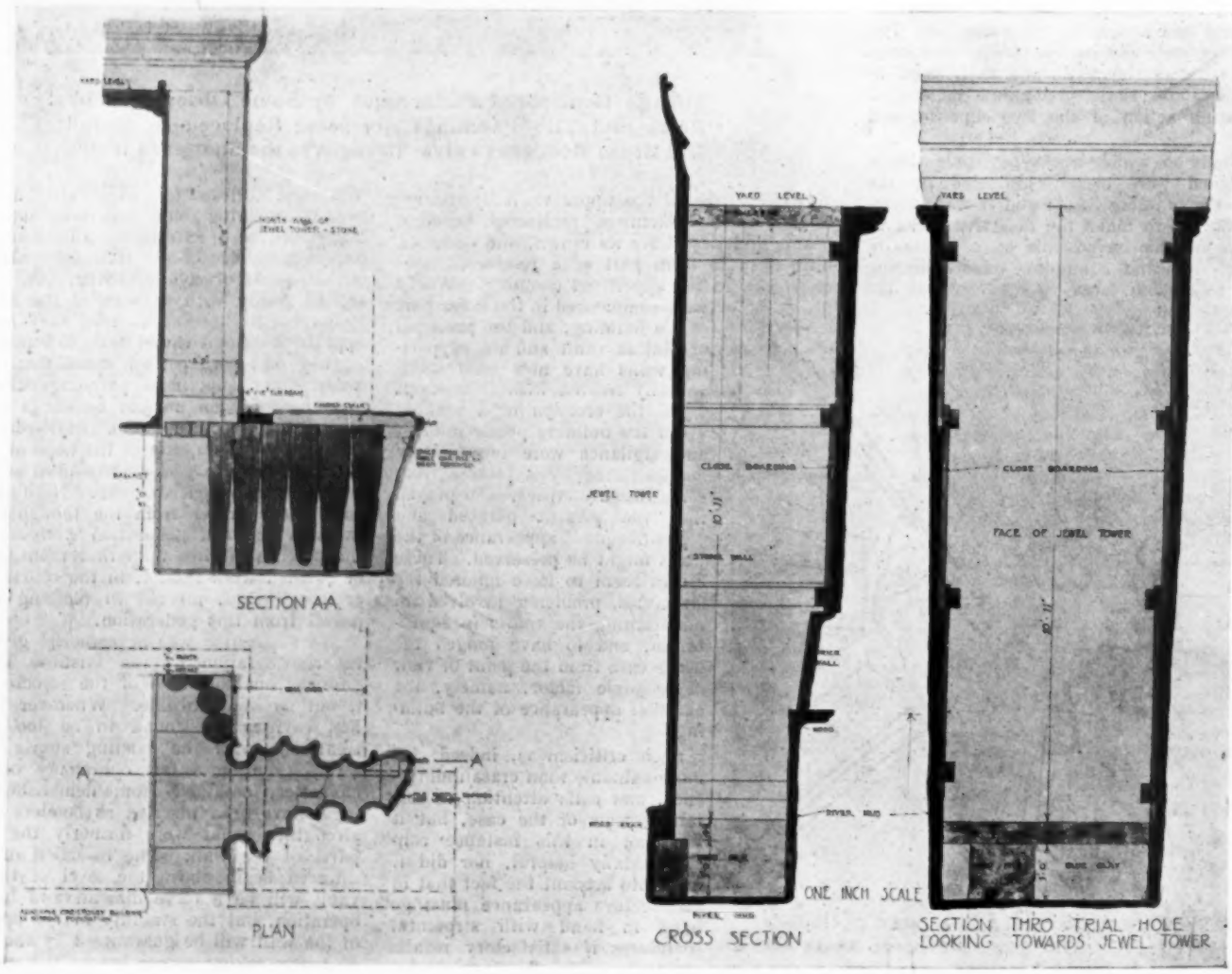


SECTION.



GROUND-FLOOR PLAN.



Trial Holes Dug to Investigate the Nature of the Foundation. The Elm Piles were in Good Condition, and the Foundation Sound.

TOWERS AND SPIRES.

I.—SALISBURY CATHEDRAL.

BY SIDNEY TOY, F.S.A., A.R.I.B.A.

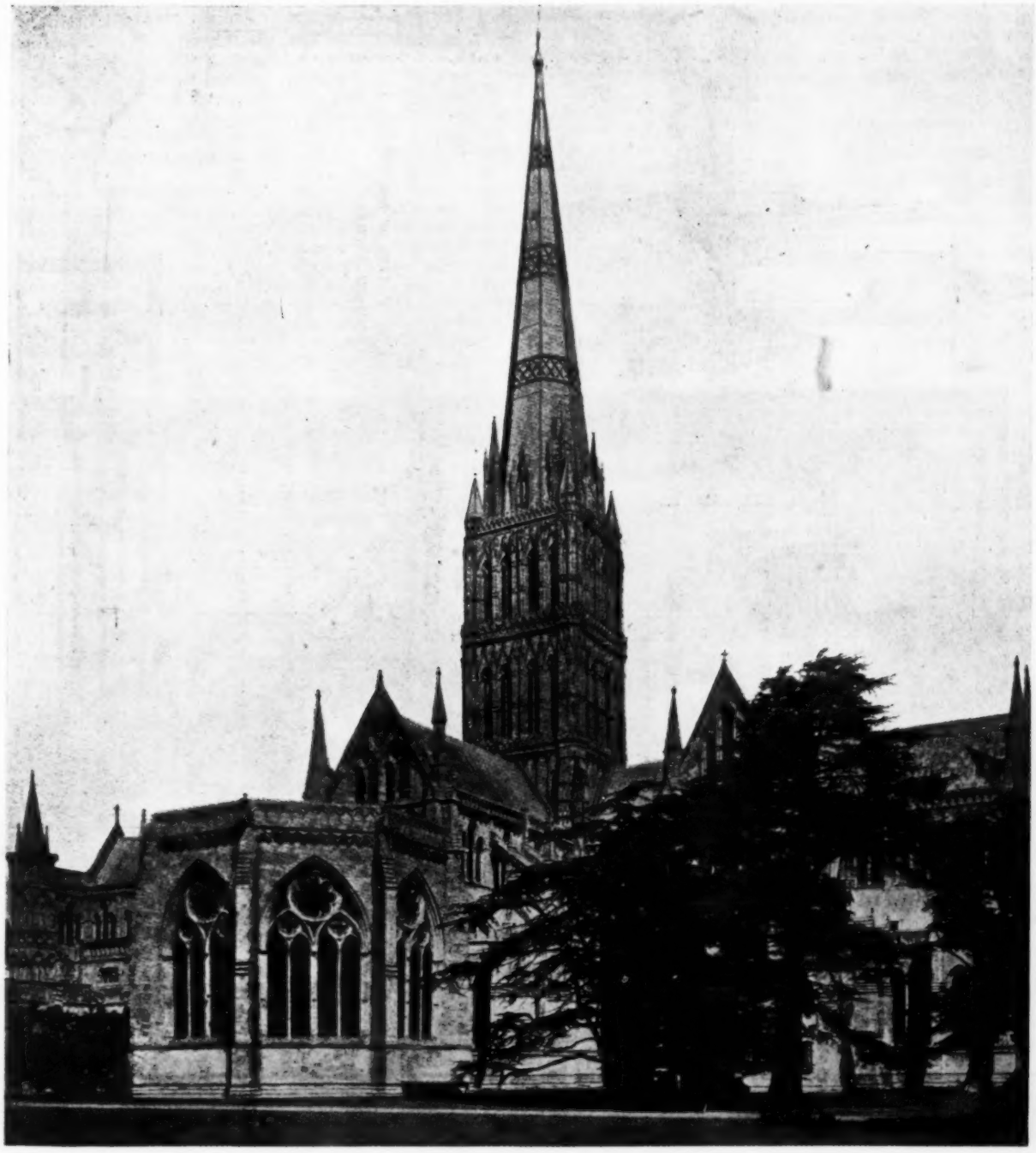
THE erection of towers and spires over the central space of mediæval buildings presented problems of construction of such complex character as required the greatest ingenuity in solution, and, since the dynamic principles involved in these problems are constant and should be thoroughly understood, an investigation of the manner in which they were overcome and solved by the mediæval builders will form a useful field of study for the architect of the present day, who is often faced with problems of a similar nature. It is proposed, therefore, to devote a series of articles to the examination of some typical examples of towers with spires and similar finials erected during the Middle Ages over the central crossing of cruciform buildings: that is, in positions which before that time were usually covered by domes. The tower and spire of Salisbury Cathedral, though not in strict chronological order, will form the first subject for examination.

The cathedral church of Salisbury was begun in 1220 and, in respect to the church itself, was completed in 1258, but the upper stages of the tower and the spire were not added until about 80 years later. That the tower is the work of about 1330 is evident from its general character and details, and that so ponderous a superstructure was not contemplated by the first architect is obvious from the inadequacy of the support provided; but the exact date of the addition can only be inferred from the references to building operations in the chapter archives. In 1331 Edward III granted to the chapter permission to use the stone of the former cathedral at Old Sarum "for the improvement of the church of New Sarum and the close thereto belonging," and in 1334 Richard de Farleigh, an architect of repute, was commissioned for building work at the cathedral. It is probable, therefore, that Richard was responsible for the design and execution of the tower and spire, though the stones he selected for the facing of this particular work would be naturally taken directly from the quarry.* The lantern stage of the tower formed part of the church as finished in 1258, and this was covered, probably, by a timber fleche containing the bells; but even this weight and the thrusts set up occasioned considerable anxiety and arched struts with inverted arches above were soon thrown across the eastern transept, while about the period of the construction of the tower the bells were removed to an isolated campanile built for their reception to the north of the church.†

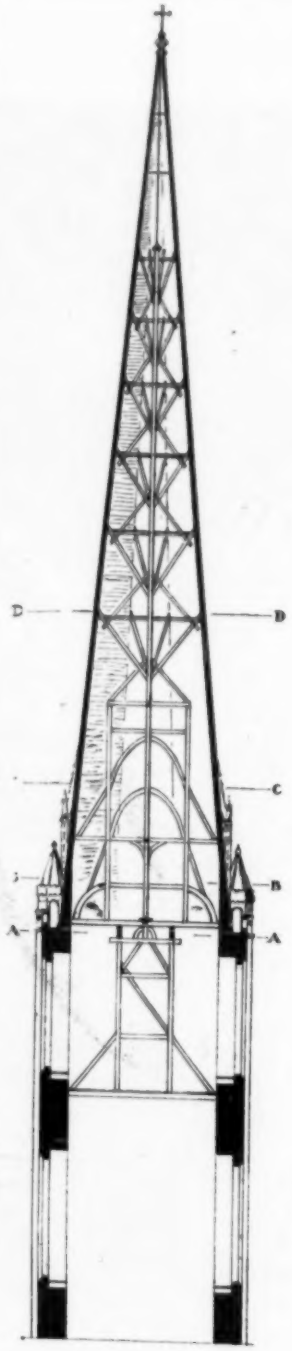
Before commencing the actual building of the tower and spire it was first necessary to support and secure adequately the lantern which was to form the base of the new work. This was effected by a skilful system of buttresses and ties. Flying buttresses were erected in the triforium and clerestory stages of the choir, nave and transepts (fig. 1). These were built in the rear-arches, as shown on the right-hand side of

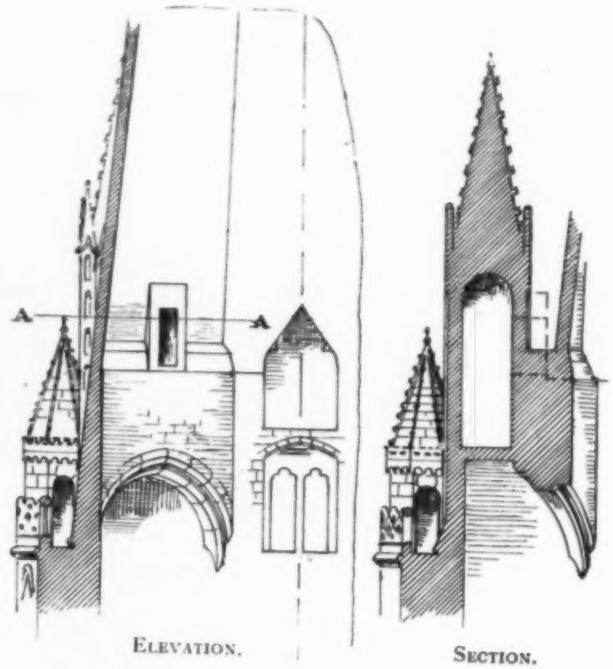
* The provisionary character of the agreement between the precentor and Richard of Farleigh, showing as it does the timorous manner in which the proposals of the latter were regarded, lends additional support to this inference. *Vide*, "A History of Salisbury," by the Rev. E. E. Dorling, p. 71, and a monograph of the Cathedral by William Dodsworth, p. 151.

† This campanile was pulled down by Wyatt in 1790



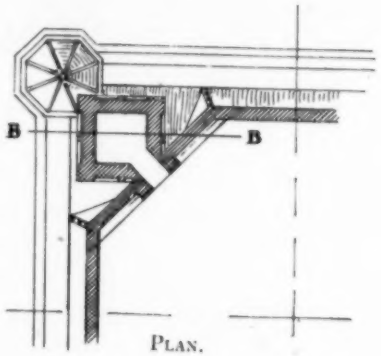
Salisbury Cathedral.





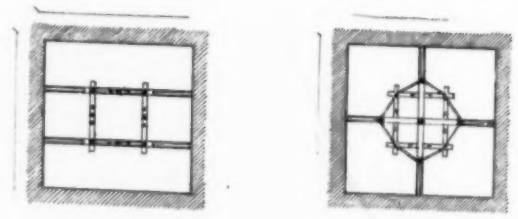
ELEVATION.

SECTION.



PLAN.

FIG. 2.—ONE OF THE SQUINCH ARCHES.



PLAN A.A. PLAN B.B.

FIG. 3.—TIMBERWORK IN SPIRE.

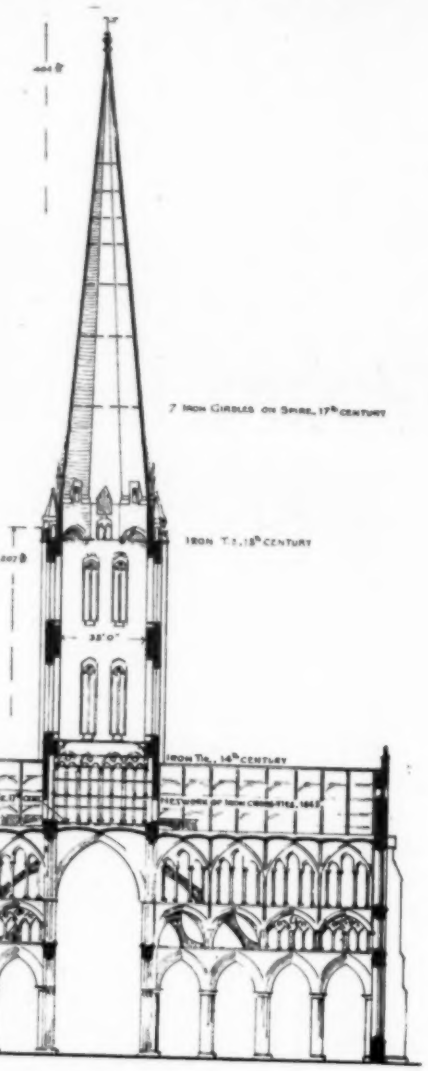
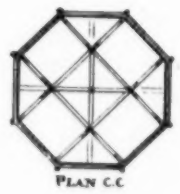


FIG. 1.



PLAN C.C

PLAN D.D

The Tower and Spire of Salisbury Cathedral. (*See p.* 61).

the figure where the front arches are omitted, all incline towards the tower, and together form a powerful system of what are virtually stone raking shores, supporting the tower on all sides and distributing its thrusts over several arches of the adjacent arcades. Diagonal flying buttresses were also added, which, springing from the re-entering angles of the aisle walls, divided near the head and abutted the angles of the tower at two different heights, while low buttresses about 15 ft. deep were built against the tower on the top of the clerestory walls. Having established supports on all sides the lantern itself was consolidated by connecting the main piers of its arcades to the outer wall with stone webs thrown across the gallery, and by the insertion of a powerful system of iron ties at the level of the arches of these arcades. The latter securely clasps the walls of the tower together both inside and outside, and is a fine example of mediæval forging. It received the encomium of Sir Christopher Wren, who was called in to examine the fabric in 1669, and who attributed the preservation of the tower itself to its presence; but the process of oxidation has produced serious effects on the stonework adjacent to some of the ironwork employed, though it was covered with sheet lead. Considerable care and skill has been exercised in the construction of the two upper stages of the tower and the spire on this base. The squinch arches, which carry those sides of the octagonal spire falling on the corners of the tower, have their voussoirs locked together by iron clamps to ensure their rigidity despite their lack of adequate abutment; and the tall pinnacles which rise above the broaches, and are so necessary to counteract the thrust at these points, are built hollow that their weight might be distributed along their sides where it is required and not act in the centre (fig. 2). The shell of the spire from the level at which it reaches its true development throughout the whole of its height to the apex is only 9 in. thick. The newel stairways built at the corners of the tower, however, are a source of weakness and in the course of time, probably owing to the spreading of the great arches of the crossing, became considerably fractured.

Within the spire and rising from the upper stage of the tower to the apex of the spire itself is an ingeniously devised timber centering the design and construction of which will be understood by reference to the section and plans given in fig. 3. This timberwork, though considerably repaired during the seventeenth century and at later periods, doubtless represents the scaffolding erected for the construction of the spire, but it is equally unquestionable that it was especially designed with a view to its permanent retention in position as a security, of desirable elasticity, against the effects of storms and other adventitious occurrences. The lowest part of this work, in the tower, consists of two heavy beams 1 ft. 3 in. square and four strutted and braced uprights 10 in. square, and the underwork of the centering proper, within the spire itself, of two crossbeams supporting at their junction a central post which ascends through the whole height of the work to the level of the uppermost platform, and of four strutted and braced uprights rising from the crossbeams about midway between the central post and the wall. The resilient character of the junction of these two parts of the substructure will be appreciated by an examination of plan B.B. (fig. 3), from which it will be seen that the vertical timbers of the upper part have no correspondence with those of the latter. The head of the central post is pinned to the vane rod, and crossbars, projecting from the vane rod, are dowelled into the stonework as shown in fig. 3, so that the whole of the apex of the spire is securely held down to the timberwork beneath.

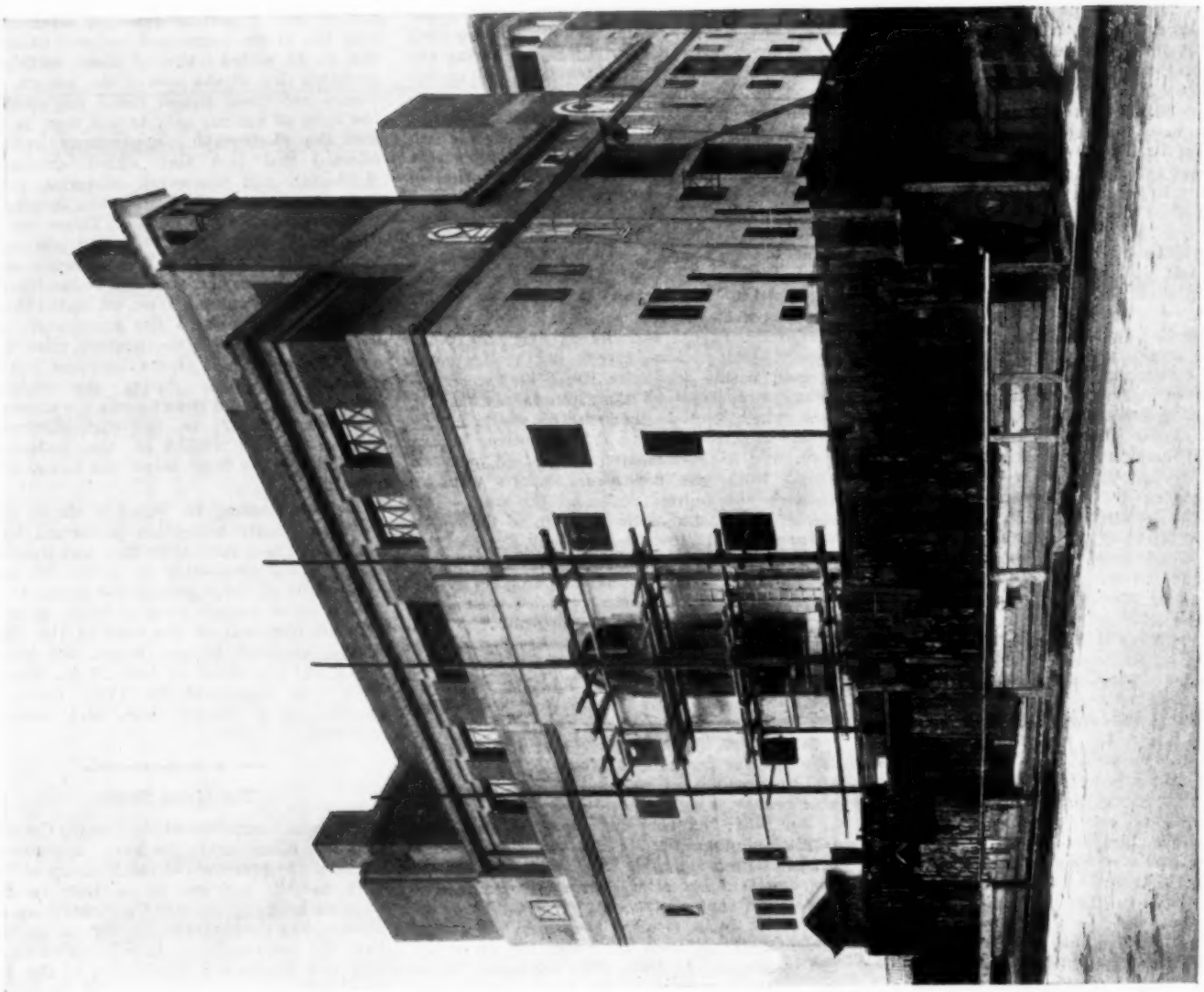
Such, then, is the design of this daring structure and the precautions taken for its security, and the result is a tower and spire of incomparable beauty, which concentrates and completes in an ideal manner the group of buildings beneath photograph. It has been, however, an occasion of considerable anxiety from the first. The great arches of the crossing became distorted and the substructure generally began to crack and settle. During the latter half of the fifteenth century arch struts were thrown across the transepts. In 1669, Sir Christopher Wren was called in to examine the fabric and, having noticed the important function filled by the iron tie, above mentioned, ordered other iron ties to be added. One of these additions is probably that at the base of the lantern, while others are those passed round the outside of the spire at various heights and seen in fig. 1 and the photograph. Reparations were also effected and iron ties added during the eighteenth and nineteenth centuries, particularly in 1865 when the lantern was secured by a whole network of iron ties. These last pass diagonally across the tower, and piercing the walls, are carried round the angles on the outside and over flat bars, laid vertically on the face of the buttresses. Wren estimated that the spire inclined towards the south-west, owing to the settlement of the western piers to the extent of about 2 ft., but subsequent and more accurate plumbing during the eighteenth century and within recent years has shown that the amount is 22⅜ in. and that this has not increased. The extent of the deflection is marked on the floor below the centre of the crossing.

It is interesting to record a simple act of faith in saintly protection performed by the builders of this spire after they had themselves taken every precaution to secure its safety. In a cavity of the capstone they inserted a relic consisting of a small piece of fabric, possibly a reputed fragment of the robe of the Blessed Virgin, enclosed in two boxes, the inner of wood and the outer of lead 5½ in. diameter. This was discovered in 1762, during the erection of a copper vane, and reverently replaced.

The Menai Straits.

The joint committee of the County Councils of Carnarvonshire and Anglesey appointed to consider the proposals of the Ministry of Transport for the erection of a new reinforced concrete bridge in place of the Menai Suspension Bridge, has decided to ask for a guarantee that the new archway it is intended to build will not hinder the navigation of the Menai Straits.

FIREPLACE IN LIVING-ROOM.
"Ockhams," Edenbridge. MESSRS. BAILLIE SCOTT & BERESFORD, Architects.



The "Fortune" Theatre, Russell-street, W.C.: Progress View.
MR. E. SCHAUFELBUHL, Architect.

New Premises for the Anglo-Persian Oil Co., Moorgate: Progress View.
SIR EDWIN LUTYENS, R.A., Architect.

TALL BUILDINGS, TALLER BUILDINGS, AND SKYSCRAPERS.

By HORACE R. APPELBEE.

WHAT a difference is made by the way a case is presented. A street is 20 ft. wide and the buildings on either side 50 ft. high. Is the street narrow, or are the buildings lofty? When Middle Row existed in Holborn, Staple Inn was, I suppose, a lofty building, and now Middle Row is gone and forgotten, Staple Inn is nowhere near so high as the street is wide.

In Italy the main cornice often projects to the centre of the street. Is it a dangerous projection, or is the street narrow? In Venice I saw buildings so tall that one could touch the walls on both sides of the street at the same time; and even in London I have served a party-wall notice on the adjoining owner when there was a street in between. Now someone has been to America looking at tall buildings and skyscrapers. He has come back telling us horrible tales and uttering warnings. He complains they make dark streets and cause congestion of traffic. The same here with low buildings, I think.

Of course, the fault with the tall buildings of New York and Chicago is not that they are too tall, but that they are too close together (which is quite another tale). The fault with the low buildings of Cheapside and Wood-street and other City streets is just the same: they are too close together. I assert without the slightest fear of contradiction that for a given amount of accommodation upon a given area, tall buildings will give more light, more air, more sunshine, more space for traffic in a business centre, more space for recreation in a residential quarter than low buildings.

Buildings 50 ft. high on both sides of a street 20 ft. wide suggest dark, confined space and congestion of traffic. Buildings 200 ft. high and streets 200 ft. wide suggest to my mind well-lighted rooms, open spaces, and plenty of room to move. These figures are not chosen by chance; they are the result of certain calculations showing different ways of putting the same amount of accommodation on the same site.

As I believe in argument of the two and two make four type I will endeavour to prove my contention mathematically. Take a unit room (or floor space) about 20 ft. square and, say, 10 ft. high. One hundred such rooms will exactly cover an acre. In the form of a square there will be ten rooms on each face. All the ground is covered. There are no streets or alleyways, and no windows are possible. Now put one room in the centre of the acre and the others on top as a column, and we have a skyscraper; but we also have 99 per cent. of the acre of space open around it for traffic, and every room has a window in every wall. A skyscraper 1,000 ft. high on a base 20 ft. square would, of course, be unstable, and there is no need to make building law against it, as no one would attempt to build it.

Let us restack our rooms, four on a floor and 25 stories high. The result would be a building perfectly stable, no doubt, and every room would be a corner room with two window walls. And if adjoining acres were to be treated in the same way, the buildings would be 170 ft. apart. That seems to prove my contention sufficiently. It is, however, possible to improve greatly the arrangement by placing each building opposite the space between two buildings on the other side of the street, and in that case, while the same area is covered, the buildings are 380 ft. apart. Assuming the stories as much as 12 ft. high, the building would only total 300 ft. Wonderful open lighting, and 96 per cent. of the ground area not built on.

So far we have only considered an acre of covered space on an acre of site; we often get more, of course, but probably, looking at a large area or district, it never exceeds two acres of covered floor space to one acre of ground. (Exact figures are, of course, unobtainable.) With tall buildings such as I have described there would still be 92 per cent. of total area uncovered, and all could be street and available for traffic. If the buildings were reduced to a uniform four stories, only 50 per cent. would be uncovered, and of that a large part would be in the form of private lighting courts, so that street space would not be more than one-third or one-quarter of that possible with tall buildings.

Mr. Unwin quotes 45 ft. of rentable floor space per head of population as the result of his American experience. Presumably we must about double that to obtain the building area. The day population of the "square mile," known as the City of London, appears to be about 700 per acre. 700 by 90 gives 62,000 sq. ft. of building required, and this in a fifteen-story building needs a ground area of 4,200 sq. ft. only. By making the building cross-shape for stability we may need a little more, and, say, 10 per cent. of the area is covered and 90 per cent. available for street. The cross will be about 80 ft. overall on plan, and a square of one acre about 210, so that the buildings will be 130 apart or 170 between the arms. If every square were dealt with in the same way we should have a chess-board city, every square representing an acre, and on it one building containing 700 persons, and with 10 ft. stories, 150 ft. high and on the average considerably more than 150 ft. apart. Consequently no rooms above ground get less than an angle of 45 degs. of light, and the worst angle applies to only one room in fifteen against one in every two or perhaps three in our present city. All look out on to wide open spaces.

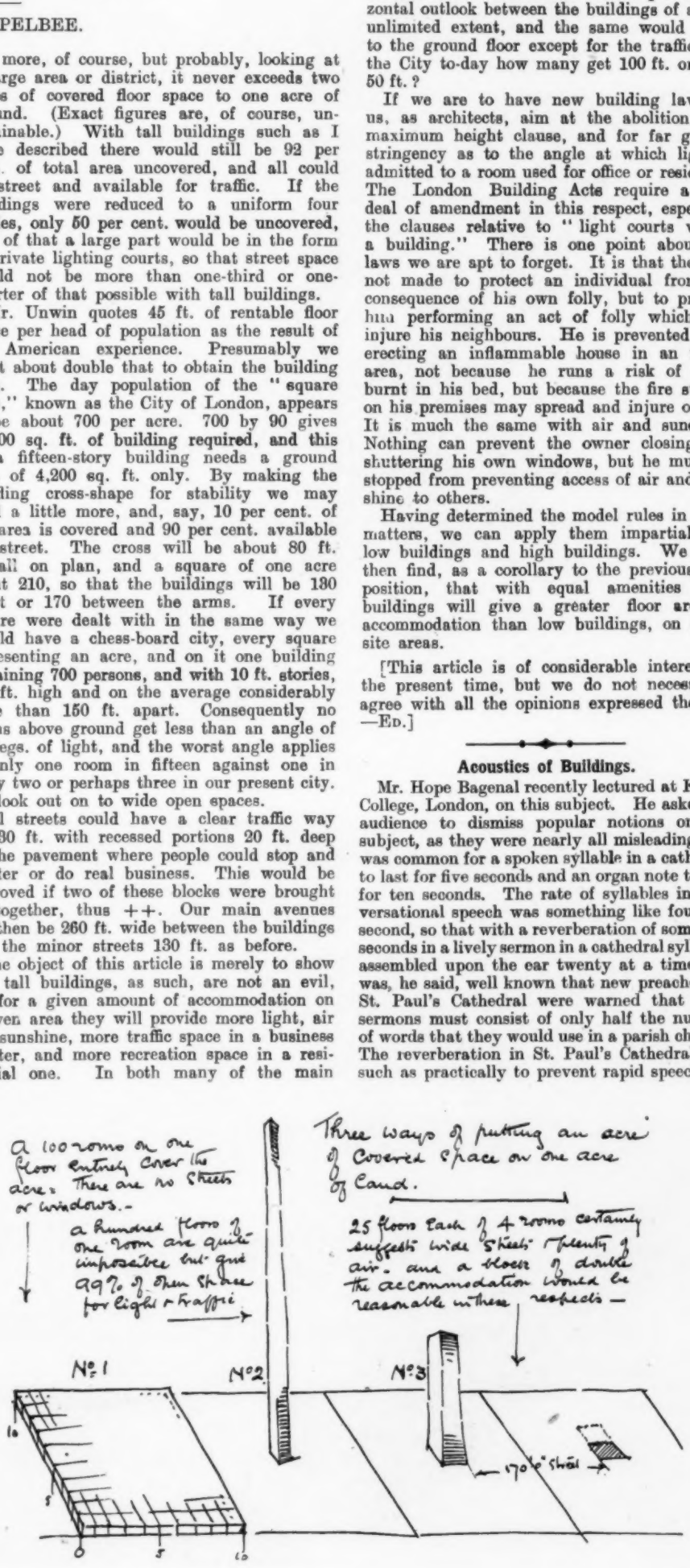
All streets could have a clear traffic way of 130 ft. with recessed portions 20 ft. deep on the pavement where people could stop and chatter or do real business. This would be improved if two of these blocks were brought up together, thus ++. Our main avenues can then be 260 ft. wide between the buildings and the minor streets 130 ft. as before.

The object of this article is merely to show that tall buildings, as such, are not an evil, but for a given amount of accommodation on a given area they will provide more light, air and sunshine, more traffic space in a business quarter, and more recreation space in a residential one. In both many of the main avenues could be planted with forest trees without detriment to the light of the buildings. It will help to realise the nature of the change if it is pointed out that most of the rooms on the first floor would have an unimpeded horizontal outlook between the buildings of almost unlimited extent, and the same would apply to the ground floor except for the traffic. In the City to-day how many get 100 ft. or even 50 ft.?

If we are to have new building law, let us, as architects, aim at the abolition of a maximum height clause, and for far greater stringency as to the angle at which light is admitted to a room used for office or residence. The London Building Acts require a good deal of amendment in this respect, especially the clauses relative to "light courts within a building." There is one point about by-laws we are apt to forget. It is that they are not made to protect an individual from the consequence of his own folly, but to prevent him performing an act of folly which will injure his neighbours. He is prevented from erecting an inflammable house in an urban area, not because he runs a risk of being burnt in his bed, but because the fire started on his premises may spread and injure others. It is much the same with air and sunshine. Nothing can prevent the owner closing and shuttering his own windows, but he must be stopped from preventing access of air and sunshine to others.

Having determined the model rules in these matters, we can apply them impartially to low buildings and high buildings. We shall then find, as a corollary to the previous proposition, that with equal amenities high buildings will give a greater floor area of accommodation than low buildings, on equal site areas.

[This article is of considerable interest at the present time, but we do not necessarily agree with all the opinions expressed therein, —ED.]


A 100 room on one floor entirely cover the acre: There are no streets or windows.-
a hundred floors of one room are quite impossible but quite 99% of them should be for light & traffic
Three ways of putting an acre of Covered Space on one acre of Land.
25 floors each of 4 rooms certainly suggests wide streets plenty of air. and a floor of double the accommodation would be reasonable in these respects —
No 1
No 2
No 3
170'0" Street
10
5
0
5
10

Acoustics of Buildings.

Mr. Hope Bagenal recently lectured at King's College, London, on this subject. He asked his audience to dismiss popular notions on the subject, as they were nearly all misleading. It was common for a spoken syllable in a cathedral to last for five seconds and an organ note to last for ten seconds. The rate of syllables in conversational speech was something like four per second, so that with a reverberation of some five seconds in a lively sermon in a cathedral syllables assembled upon the ear twenty at a time. It was, he said, well known that new preachers in St. Paul's Cathedral were warned that their sermons must consist of only half the number of words that they would use in a parish church. The reverberation in St. Paul's Cathedral was such as practically to prevent rapid speech.

Banque Belge Pour L'Etranger, Bishopsgate : Progress View.

SIR EDWIN COOPER, F.R.I.B.A., Architect.

New Premises for the Gresham Life Assurance Society, Ltd., Fleet-street, E.C.

MR. T. B. WHINNEY, F.R.I.B.A., in conjunction with MESSRS. CAMPBELL JONES, SON, AND SMITHERS, Architects. (*See p.* 67.)

NEW PREMISES FOR THE GRESHAM LIFE ASSURANCE SOCIETY, LTD.

Mr. T. B. WHINNEY, F.R.I.B.A., in conjunction with Messrs. Campbell Jones, Son, & Smithers, are the architects for this building. The elevations were designed by Messrs. Campbell Jones, Son, & Smithers. The building is of steel frame fire-resisting construction. A large area at the back is faced white glazed bricks. The fronts to Fleet-street and Clifford's Inn-passage are in Portland stone, with a granite plinth 3 ft. high. The floors are fire-resisting, steel cased in concrete. The door architrave is carved with low-relief leaf ornament. All windows are steel, those to the ground floor being bronze faced. There are ornamental iron railings to the cornices and balconies on the Fleet-street elevation, as shown. The basement contains accommodation for filing and storage, heating and ventilating plant, lavatories and kitchen for messengers.

The ground floor is 18 ft. high, with walls lined Calocara marble, and ceiling ornamented in fibrous plaster. The public space (corridors) is paved with Roman mosaic, the remainder of the floor being wood block. The lighting is by alabaster bowl fittings. The first floor is to be used by the heads of departments and general managers, and contains a large board-room, committee, and luncheon room. The second and third floors are to be used as offices, with a luncheon room on the third floor.

On the fourth floor are offices and caretakers' quarters. There are kitchens, servery and luncheon rooms on the first and third floors.

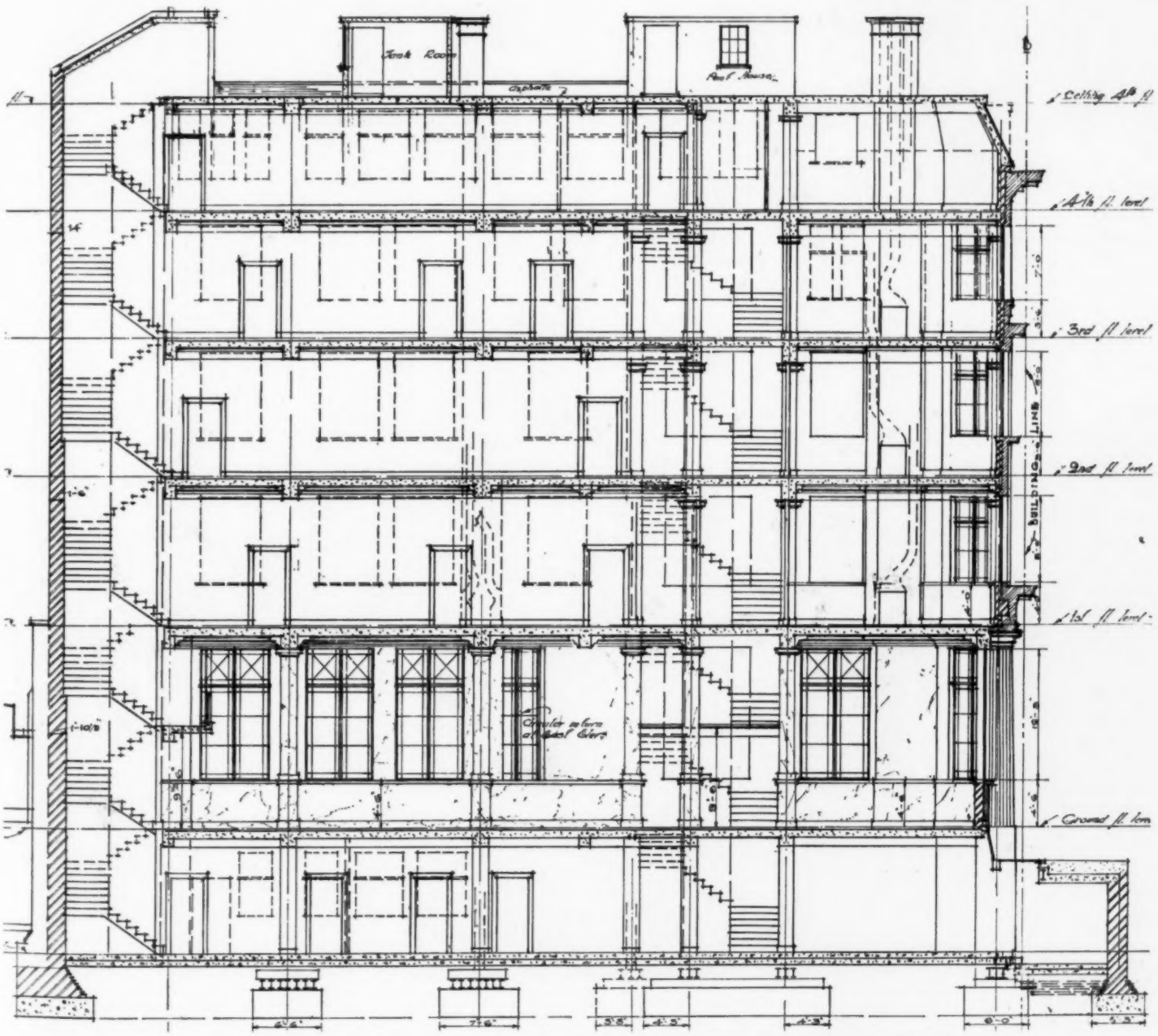
The stairs are of "Empire" stone, with marble dado. Mezzanine landings are placed between the ground and first floors, and have ornamental iron railings and bronze handrail. All other handrails are of mahogany, fixed with bronze brackets.

Heating is by low-pressure hot water; the basement is ventilated artificially.

The general contractors are Messrs. F. D. Huntington, Ltd., and the sub-contractors include: Steelwork: Redpath, Brown & Co.; stone: F. J. Barnes; floors: Kleine; windows and lantern lights: Crittalls'; drainage: Burn Bros.; electric wiring: Bell Bros.; strong-room and vaults reinforcements: B.R.C.; heating: Norris & Dutton; plumbing: Davis Bennett; lifts: Express Lift Co.; granite: Fennings & Co.; sanitary fittings: George Jennings; mosaic and terrazzo: Diespeker & Co.; fibrous plaster: John Tanner & Son; marble work: H. C. Tanner; ventilating plant: Sturtevant Engineering Co.; revolving door: Samuel Elliot (Reading); internal joinery: The Young Construction Co.; tile radiator backs and lavatory tiling: Martin Van Straatten; electric light fittings: Comyn Ching & Co., and Metropolitan Vickers Co.; wood-block flooring: Acme Wood-Block Flooring; metal railings: Comyn Ching & Co.; bricks: The Stourbridge Brick Co.; metal lockers: The Art Metal Equipment Co.; ironmongery: Marley Bros.; fire grates and tiles: O'Brien, Thomas & Co.; pavement lights and bulkhead lights: Hayward Bros.

Bristol's Slum Area.

At the last meeting of the Bristol City Council, Alderman Sheppard presented the report of the Housing Committee dealing with the clearance of slum area in St. James'. It is proposed to clear this area in sections; as soon as one block of the dwellings they were now building in St. Jude's was completed they would remove some of the people from the condemned area to it. This is part of a scheme which he hoped would be developed on a large scale. The area proposed to be dealt with, Eugene-street, St. James', comprises a very congested district, in which most of the houses were built in the early part of the eighteenth century.



New Premises for the Gresham Life Assurance Society, Ltd., Fleet-street, E.C.

MR. T. B. WHINNEY, F.R.I.B.A., in conjunction with MESSRS. CAMPBELL JONES, SON, & SMITHERS, Architects.

New Premises for Messrs. Lewis's, Liverpool. MR. GERALD DE COURCY FRASER, Architect.

[The general contractors for this recently-completed building were Messrs. Wm. Moss & Sons, Ltd.; Messrs. Macintyre & Sons were the contractors for the steelwork, and passenger lifts were supplied by the Waygood-Otis Co.]

Messrs. Peter Robinson's New Premises, Oxford-street : Progress View.
MESSRS. T. P. & E. S. CLARKSON and MR. H. AUSTEN HALL, Joint Architects.

Alterations to the Criterion Restaurant, Piccadilly Circus : Progress View.
MESSRS. WM. WOODWARD, F.R.I.B.A., & SONS, Architects.

ARCHITECTS AND BUILDERS' INQUIRY BUREAU.

THE new heading to this column marks the inauguration of what we trust will prove a helpful and instructive weekly feature. The frequency with which technical questions have been asked and answered in our correspondence columns has suggested the need for more prominent facilities for the free exchange of ideas among our readers. We shall, therefore, welcome the receipt of little problems which have puzzled our readers, and also solutions to the same as they appear to others. Where no satisfactory answers are forthcoming in the natural sequence of correspondence, our readers will be given access to the experience of our own technical staff, who will also endeavour to treat judicially the conflicting views which may be forthcoming, upon contentious subjects. We look to our readers to establish the success of this new feature, which we confidently expect to meet a long felt need to those interested in the art of sound building.

We take the opportunity of printing below a query received from a correspondent. The point raised is of such immediate interest that we welcome it as a very auspicious opening to "The Architects' and Builders' Inquiry Bureau."

Correspondence for this column should be marked on the envelope "Inquiry Bureau."

Solid or Hollow Ground Floors?

SIR,—I have been for some time a little puzzled in the quest for economical methods in the construction of small houses. I notice, for instance, that, while the architect generally favours solid ground floors, covered either with composition or deal boards laid in tar mastic, the speculating builder almost invariably favours the old system of light joists on sleeper walls, with, of course, the usual surface concrete under.

It would certainly interest myself, and I think many others, to hear what some of your readers would advise, together with the considerations that would influence their decisions, both as to cost, upkeep, and convenience. Modern conditions tend to exaggerate the relative importance of initial cost, though this often becomes the decisive factor.

I have had frequent complaints as to the ill effects of condensation gathering on the cold, hard surfaces of solid floors to the detriment of carpets, linoleums, and the general atmosphere and temperature of the house. On the other hand I find few houses with the old type of hollow ground floor, entirely free from mice and vermin.

I think we are a little apt to follow precedence in these matters without sufficient deliberation, and an occasional "inquest" will frequently break up a blind game of "follow my leader."

ECONOMIST.

Use of Tar for Paint on Steelwork.

We have received the following reply to the letter in our issue for December 28:—

SIR,—May I refer to the letter from a correspondent seeking information as to the above?

The specification he refers to is certainly an unusual one, as ordinary gas-tar is hardly considered a good covering for steelwork; besides being subject to softening during hot weather, it is always more or less sticky, and induces the particles of dust in the atmosphere to readily settle. Again, it is an impossible covering if following tints may be required at some later time.

I think it will be generally admitted that no paint which attracts destructive particles, and increases the resistance to impinging wind on or along its surface, can be said to be good.

I enclose a copy of a very interesting old report from a French engineer, who refers to the experiments of M. Valet, then Chief Engineer to the "Chemin de fer de l'est français." It will be seen from this that his conclusions as to the effect of tar on iron structures are not favourable. The surfaces of the structures were badly attacked when coated with tar, or paints prepared with tar or its derivatives.

The cracking of tarred surfaces is a well-known phenomenon, and it is expressed in technical language by the editor of my notes, thus, "with tars the dissolvent of the second coating dilutes and dissolves a part of the first, and also evaporation does not proceed in a regular manner—thus a paint is produced which is not of a uniform thickness—(this, of course, increases the surface resistance). With the departure of each volatile element a void is produced, and we get in the semi-fluid coating as many cavities as there are particles lost if the molecular attraction is not sufficiently strong to reunite the elements in the line of dis-aggregation . . . the phenomena of retreat gives cause to spots and gaps by which the humid air will rapidly have access."

It is also pointed out that cheap paints composed of tar products are slightly volatile and decompose into their stable products. It is stated indeed that "tar preservatives are useless," and that iron minium (iron oxide) paint is the best. I trust that your correspondent may find assistance in these remarks.

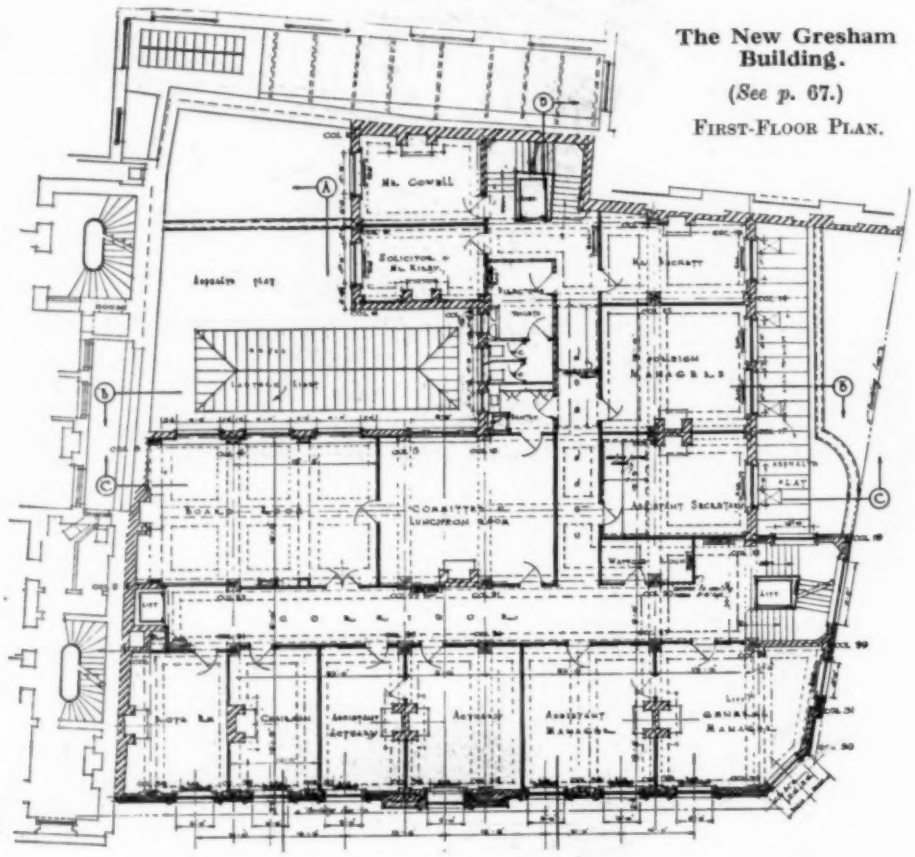
It will be understood that I am largely quoting from the papers mentioned in my possession, and also that, where reference is made to paints, it is to "cheap tar paints," and that there is and can be no reflection on any of the very well recommended bitumastic paints and compounds on the market.

Norwich. GEO. KENWORTHY.

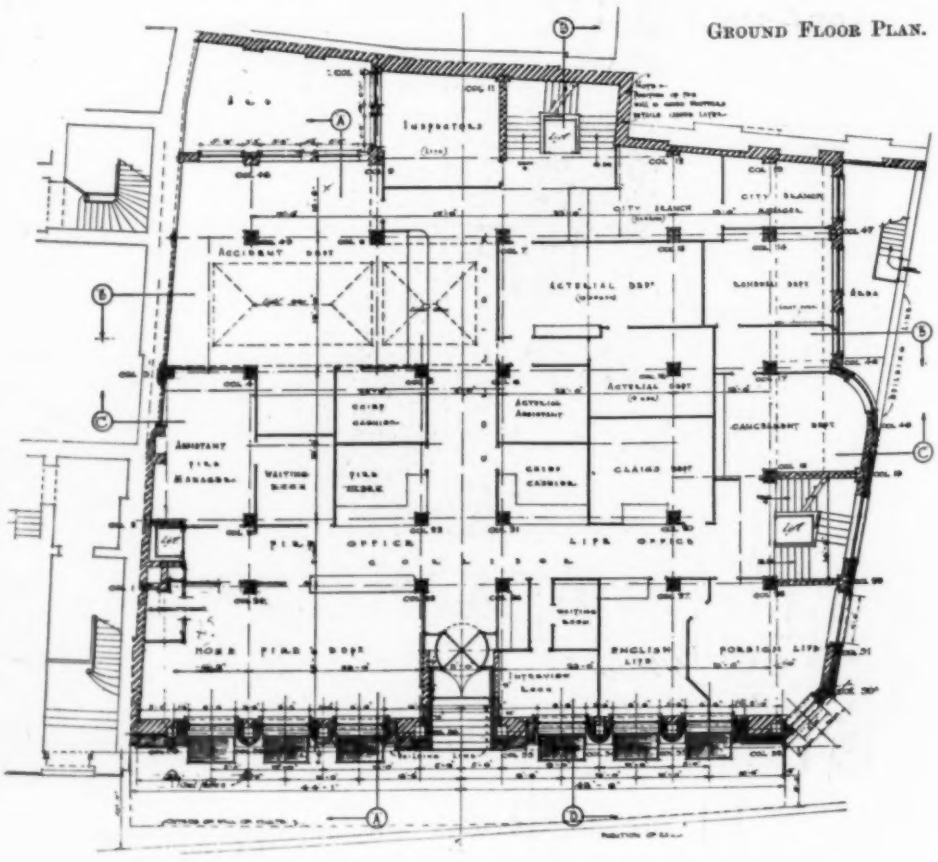
The New Gresham Building.

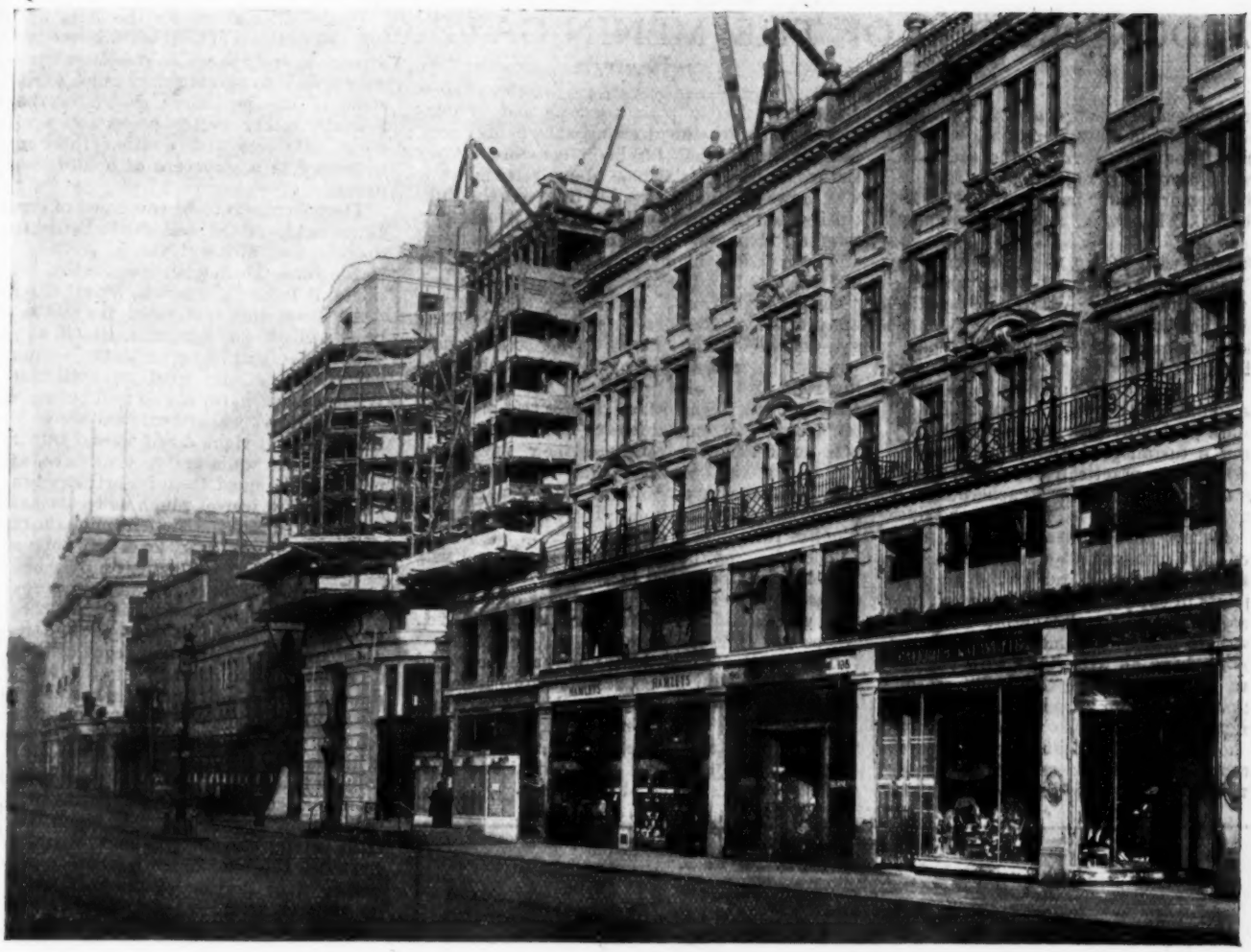
(*See p.* 67.)

FIRST-FLOOR PLAN.



GROUND FLOOR PLAN.





Rebuilding in Regent-street.

Messrs. Liberty's New Premises, Argyll-place Front: Progress View.

MESSRS. EDWIN T. HALL, F.R.I.B.A., and E. STANLEY HALL, M.A., F.R.I.B.A., Architects.

THE FOUNDATIONS OF THE MENIN GATE.

WE give in this issue a perspective and working drawings of the Menin Gate Memorial, of which Sir Reginald Blomfield, R.A., is the architect. The following particulars regarding the foundations of the memorial have been supplied by Dr. Oscar Faber, O.B.E., D.Sc., consulting engineer for the work :—

The difficulty with regard to the Menin Gate from an engineering point of view was the nature of the foundations. A trial hole revealed the fact that the soil consisted, on the average, of the following formation :—The top 4 ft. black loam and ashes, below that yellow and grey clay and sand extending down to blue clay, which was found at a depth of about 27 ft.

This yellow and grey clay is entirely waterlogged from a distance of about 12 ft. downwards and behaves practically as a quicksand under certain conditions. So treacherous is it that a trial hole 12 ft. by 8 ft., in which the sides consisted of sheet piling extending down for a distance of 35 ft., was found almost impossible to excavate as the quicksand leaked through between joints in the piling and the bottom rose at night as rapidly as the excavators were able to deal with it in the daytime. It was found impossible to drive an excavator with runners more than 12 ft. deep for the same reason, namely, that the bottom kept blowing upwards.

The original design for the foundations consisted of hollow concrete foundations more or less in accordance with the section on Fig. 1, and alternative designs were considered for this box foundation in plain concrete and in reinforced concrete, the drawing shown in Fig. 1 being actually that for plain concrete. After the result of the trial hole above referred to it was, however, found possible to avoid the difficulties of this excavation by constructing a reinforced concrete raft just below road level and supporting this on reinforced concrete piles 40 ft. long, 16 in. square. These piles extend a matter of 16 ft. into the blue clay and carry on an average about 30 tons each. Those at the sides of the foundations are raking so as to deal with the horizontal thrust due to the arch in one direction and to the pressure of the earth from the ramparts in the other. These two pressures tend, of course, to counteract each other, but it was impossible to estimate their magnitude without a risk of error and therefore some provision was made to deal with a horizontal thrust in either direction. The general arrangement of the piling is shown in Fig. 2.

The whole of the superstructure also consists of reinforced concrete clothed in stone on the exposed surfaces, except in the case of the soffit to the arch and the floors over the loggias, &c., where the reinforced concrete will be visible.

The main arch and the loggias have a coffered soffit which is to be constructed by casting it direct in specially prepared moulds. Fig. 3 and Fig. 4 indicate this coffering, and also indicate the general nature of the reinforcement, both in the arch and in some of the vertical and horizontal members of the abutments.

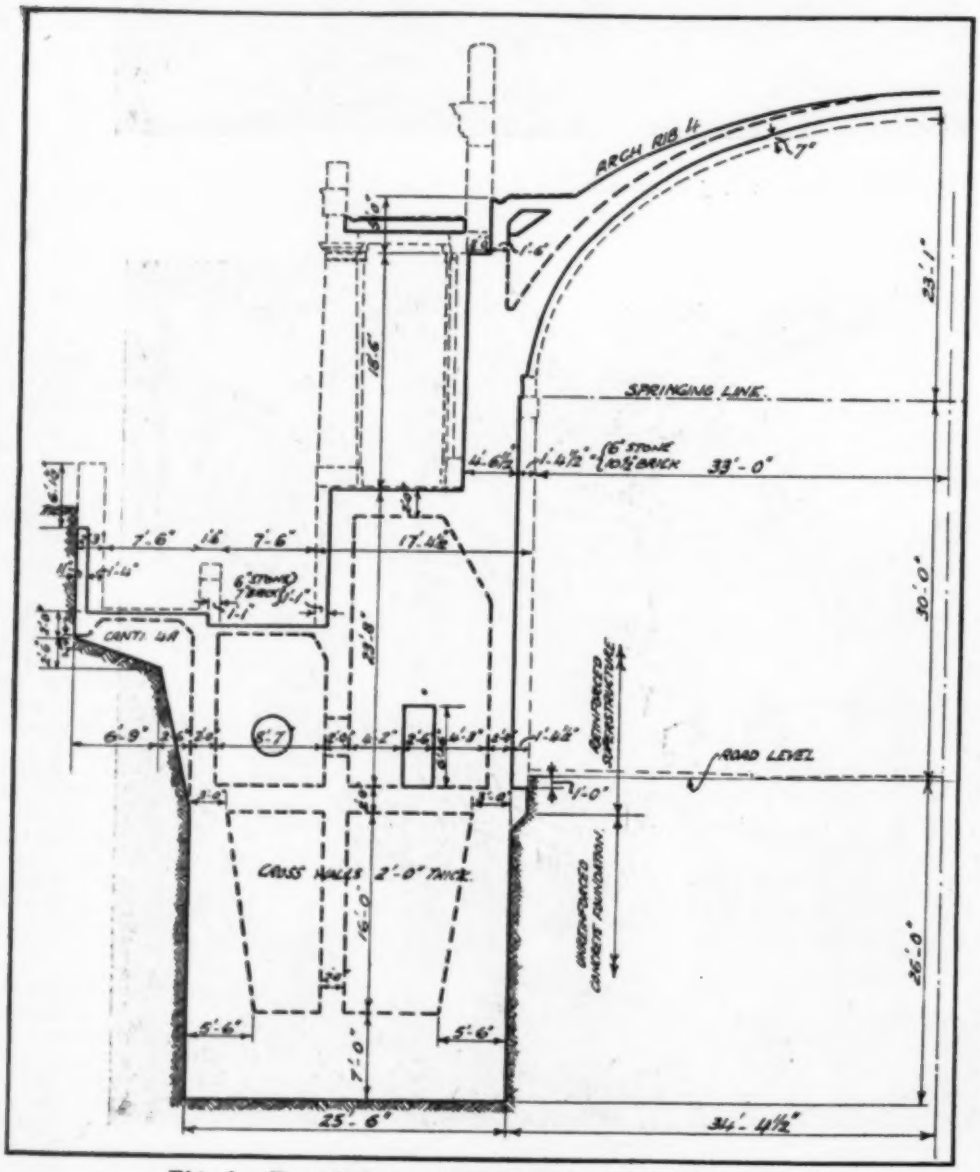


Fig. 1.—Foundations of the Menin Gate Memorial.

SIR REGINALD BLOMFIELD, R.A., Architect.

In the calculations for the arch, the stresses due to variations of temperature received careful attention, and the whole structure was designed with a view to permanence, which explains why some of the provisions shown in the figures indicate rather better protection against the effect of stress and weather than might be necessary in a structure of a more temporary nature.

The concrete is to be composed of granite and Rhine sand, and the steel is to be British Standard Specification, although this is, perhaps, unusual in Belgium, the Belgian specification being considerably lower than ours in regard to mild steel.

An interesting feature of the site is the old brick walls to the ramparts, which, as many of your readers will know, project to a considerable height above the road on each side of it. What was, perhaps, not so well known was that these rampart walls continued across the road below ground right down to and into the blue clay. These walls are very massive, and were probably designed to resist artillery fire in old-time warfare just as much as to act as efficient retaining walls to the earth forming the ramparts.

These walls at road level are approximately 10 ft. thick, but are stiffened by massive buttresses at the back of the wall at approximately 16 ft. centres, the total width of the wall at ground level to the back of the buttress being approximately 20 ft. The front of the wall has a batter of approximately 1 in 5 extending right down to the foundations, so that at a depth of about 27 ft. below the road where the walls are founded the overall width over the buttresses is about 25 ft., of which the wall itself amounts to about 15 ft. It is found that this massive brickwork construction crosses the rafts forming the foundations of the new Menin Gate, and after careful examination and repair this brick structure has been taken advantage of for supporting that portion of the raft which comes immediately upon it.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

Election of Members.

THE following were elected members of the R.I.B.A. at a Business Meeting, held at No. 9, Conduit-street, W.1, on Monday last :—

FELLOWS.

A. Ashton, St. Anne's-on-the-Sea.
J. S. Brocklesby, Merton Park.
C. D. Carus-Wilson, Sheffield.
P. I. Elton, Wandsworth.
E. C. Frere, London.
C. E. Hanscomb, Sanderstead.

ASSOCIATES.

A. R. Butler, Melbourne.
A. S. Hall, Melbourne.

R.I.B.A. EXAMINATIONS, DECEMBER, 1923.—The questions set at the Intermediate and Final (or Special) Examinations held in December, 1923, have been published, and are on sale at the Royal Institute, price 1s. 6d. (exclusive of postage).

THE LATE MR. ARTHUR CLYNE.

ON January 6, the death took place at Charlwood House, Charlwood, Surrey, of Mr. Arthur Clyne, architect of Aberdeen.

Mr. Clyne was for many years in business in Aberdeen, first as a partner in the firm of Pirie & Clyne, and latterly for many years by himself. He specialised in ecclesiastical architecture, and a number of buildings of the Episcopal Church were designed by him, including St. James's Church at Holborn Junction, Aberdeen, and the church at Drumtochty. He was the architect for a school at Fraserburgh which was destroyed by fire.

He was for ten years president of the Aberdeen Society of Architects, and was a late member of the Council of the R.I.B.A.

In 1914 Mr. Clyne left Aberdeen to reside at Cholmley Lodge.

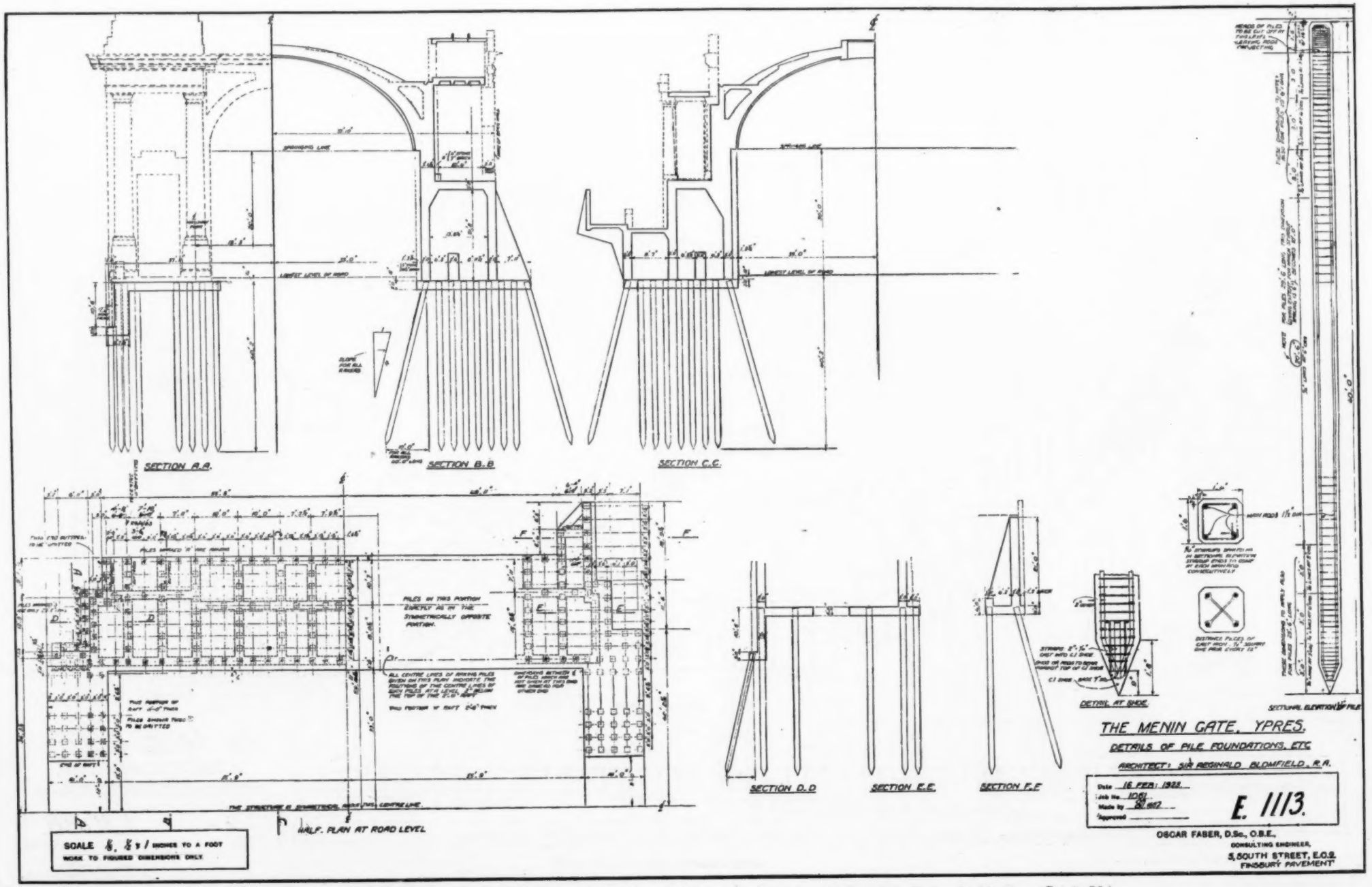


FIG. 2.—**Foundations of the Menin Gate Memorial.** SIR REGINALD BLOMFIELD, R.A., Architect. (*See p.* 72.)

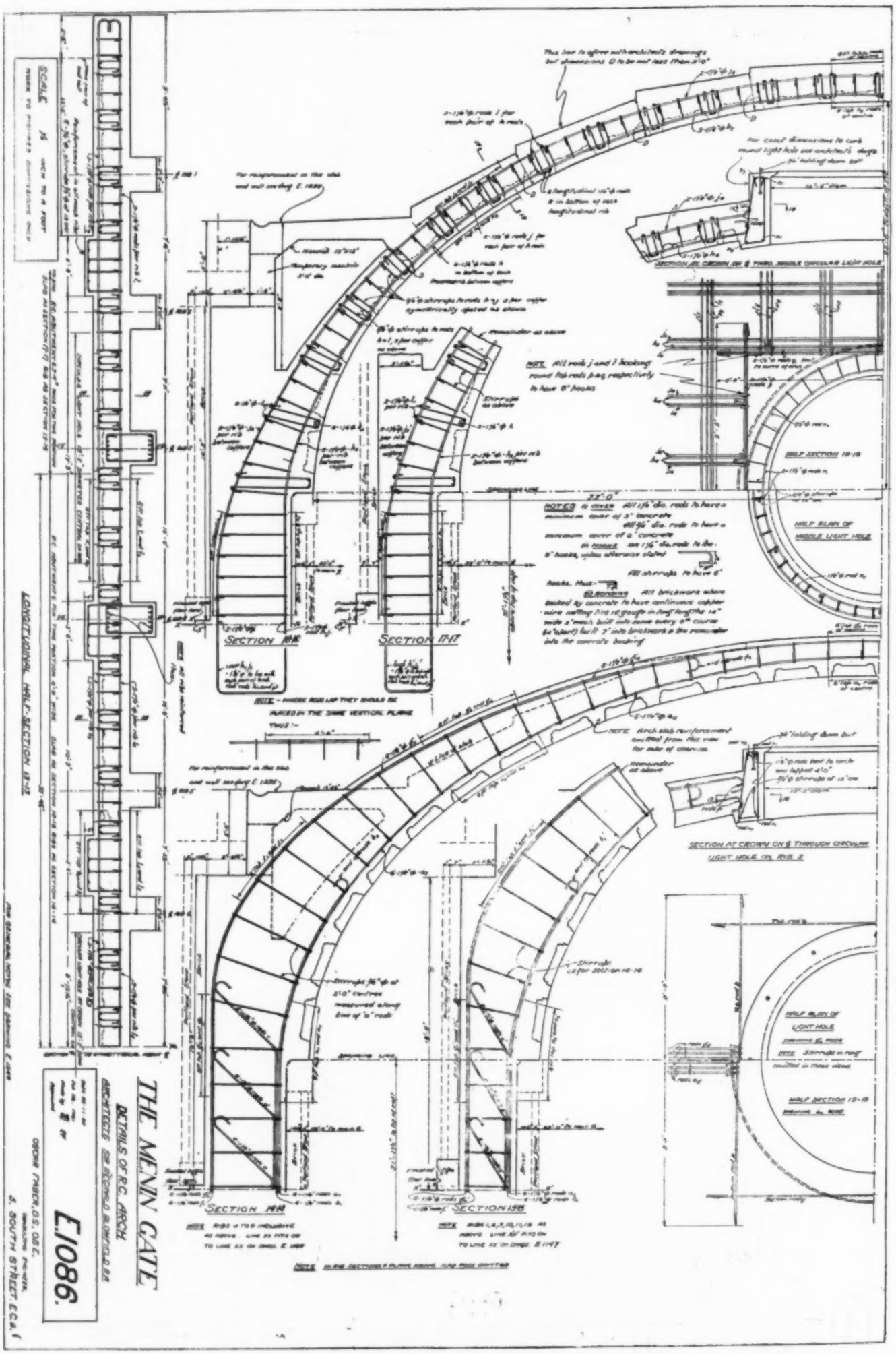

THE MENIN GATE
DETAILS OF R.C. ARCH
ARCHITECTS SIR REGINALD BLOMFIELD R.A.
OSCAR FABER, O.B.E.
5, SOUTH STREET, E.C.4.
E/1086.
LONGITUDINAL HALF-SECTION 17-17
SECTION 18-18
SECTION 17-17
SECTION AT CROWN ON ℄ THROUGH CIRCULAR LIGHT HOLE ON RIB 9
HALF SECTION 10-10
HALF PLAN OF MIDDLE LIGHT HOLE
HALF PLAN OF LIGHT HOLE
HALF SECTION 19-19
NOTES as above
SCALE 1/8 INCH TO A FOOT

FIG. 3.—Foundations of the Menin Gate Memorial. SIR REGINALD BLOMFIELD, R.A., Architect. (See p. 72.)

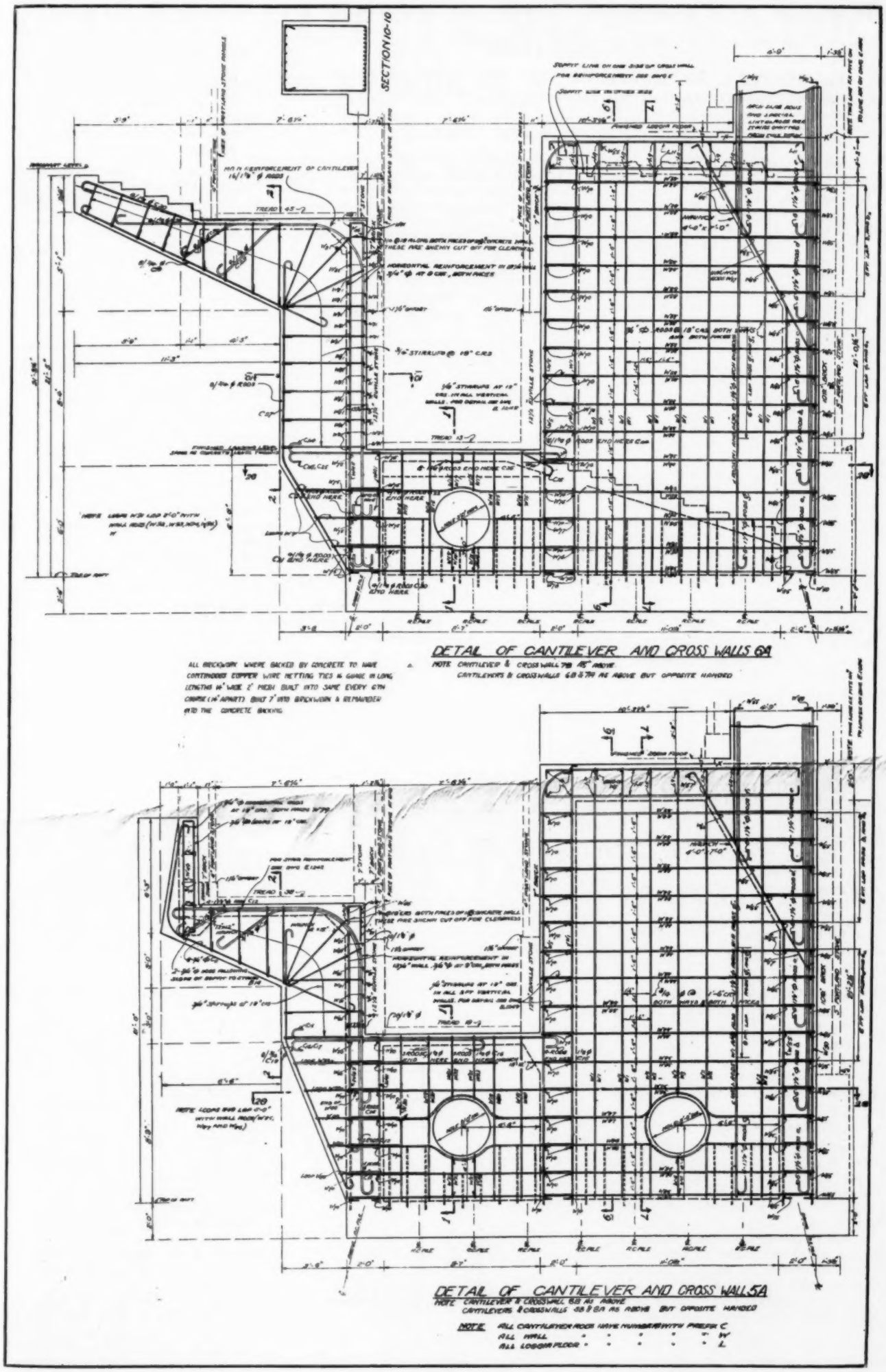


Fig. 4.—**Foundations of the Menin Gate Memorial.** SIR REGINALD BLOMFIELD, R.A., Architect. (*See p.* 72)

PRACTICAL DESIGN FOR BUILDING CONSTRUCTION

AN ELEMENTARY EXPLANATION OF THE APPLICATION OF THE THEORY OF CONSTRUCTION TO PRACTICAL DESIGN.

By EWART S. ANDREWS, B.Sc., M.I.Struct.E., A.M.Inst.C.E.

I.—WALLS AND FOUNDATIONS.

The following articles have been written with the hope of explaining to architects and builders the application to practical design of the principles of stress and strain without assuming upon the part of the readers a facility in following the mathematical language almost invariably employed by writers upon the subject. We think that it may be stated as a fact that most men who possess the qualities which draw them to the architectural profession are not proficient in the juggling with symbols which becomes second nature to men who are mathematicians.

Now the theory of construction involves certain essential scientific principles and experimental data which are commonly expressed in mathematical language, and, as architects do not understand that language, they are in danger of failure to appreciate the importance of the principles. Engineers usually have sufficient acquaintance with mathematics to understand the orthodox treatment, and to them the treatment which we shall give here may appear roundabout. At the risk, therefore, of incurring the criticism that our treatment might be made shorter, we propose to express the principles in words, and to illustrate them by diagrams and numerical examples of everyday problems arising in building construction.

In our investigations into various problems we shall have to use the terms "Strength," "Factor of Safety," and "Stability" to a considerable extent, and we must therefore at the outset obtain a clear idea of exactly what they mean.

Strength.

If we made a test of a block of concrete or of brickwork under compression we should find that at a certain load the material would fracture. If we divide this load by the area of the block we obtain a quantity which is called the compressive or crushing strength (sometimes called the ultimate compressive strength) of the material.

In a very important series of tests upon the strength of brick piers made by the R.I.B.A. the crushing load upon a brick pier 6 feet in height and 18 inches square, made of stock bricks with cement mortar (1 to 4), the crushing load was 88.5 tons. The area in square feet of the pier was $\frac{18\times18}{144}=2.25$ sq. ft., so that to obtain the crushing strength we divide 88.5 tons by 2.25 sq. ft., thus obtaining 39.3 tons per square foot. (All our calculations in these articles will be made by the slide rule, which saves a tremendous amount of time, and is quite accurate enough for all practical purposes.)

Factor of Safety.

Now in designing brickwork structures we calculate as nearly as we can the maximum pressure per square foot on the brickwork, and we arrange that this shall not exceed a certain value, which we call the permissible or working stress; in order to determine this working stress we divide the crushing strength by a number called the factor of safety. If, for example, we decide to adopt a factor of safety of 6 for stock bricks (in 1 to 4 cement mortar), we should obtain our working stress by dividing 39.3 by 6, giving 6.5 tons per square foot.

In materials of constant quality, such as steel and concrete made to rigid specification, it is usual to adopt 4 as a standard factor of safety; in other materials we employ a higher factor, according to the variation in quality of parts and workmanship that are likely to occur. Portland cement is now made to a very rigid British Standard Specification, whereas lime is a very variable material; we therefore think it necessary to use a higher factor of safety for brickwork in lime mortar than for brickwork in cement mortar. For the same reason we employ a much higher factor of safety for cast iron than for steel.

We shall treat in greater detail later the strength of brickwork and the importance of the composition of the mortar upon it, but before leaving the question of factor of safety we will point out that different authorities use the term in different senses. If we design a structure with a factor of safety of 4, it does not follow that four times the load actually carried by it will cause fracture. The factor of safety has to cover a multitude of sins; it is partly a factor of ignorance. It is not always possible to calculate exactly what is the maximum stress at a given point caused by a given loading, and, on the other hand, the loads that actually occur are very often much less than those which we take in our calculations. With the advance of knowledge we are able to forecast more accurately than before the stresses that occur, and a building designed to-day with a factor of safety of 4 may be stronger than one designed fifty years ago with a factor of safety of 6. There are still many things about the strength of some very common structures that we do not know, but we are gradually getting away from the condition of affairs some years ago, when a truthful expert was asked how it was that certain very imposing structures withstood their loads, and replied that it was "a combination of the force of habit and the kindness of Providence."

Stability.

We shall not use the word stability in quite the same sense as strength; but will use stability to indicate resistance to overturning as a whole. A wall may be strong enough in itself, but it may be unstable because it tends to overturn; this overturning may depend upon the soil upon which it is placed. It might not turn over on a very hard bed, but might do so by first canting over and sinking into a soft bed.

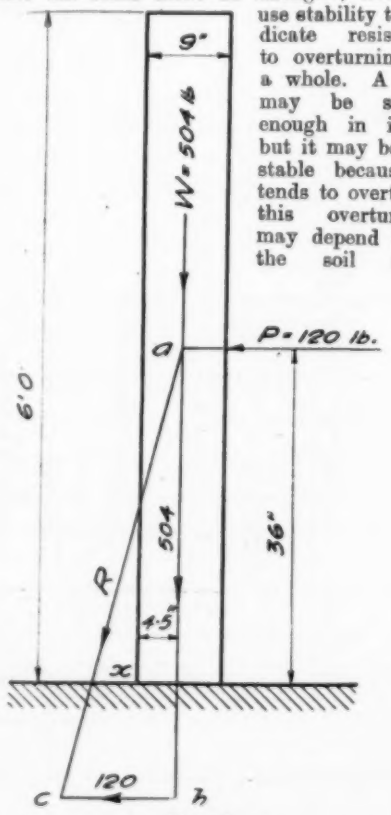


FIG. 1.

As a simple example, take the case of a 9-inch wall 6 feet high to a horizontal wind pressure of 20 lb. per square foot.

In all problems of this kind we consider the stability of a one-foot length of the wall, and in this case the forces acting on a foot length are as follows:—

(*a*) The weight W of the wall $=6\times84=504$ lb. (taking 9 in. brickwork as weighing 84 lb. per foot super.), which acts vertically down the centre line of the wall, as indicated in Fig. 1.

(*b*) The wind pressure $P=6\times20=120$ lb. (since the pressure is 20 lb. per square foot). The wind pressure is assumed uniformly distributed over the depth of the wall, so we take 120 lb. as acting horizontally at the mid-height of the wall.

There are two simple methods of testing the stability of a simple structure of this kind:—

(1) To find the resultant of all the forces acting upon the structure, and find where the line of action of this resultant force intersects the plane of the base; if this line falls inside the base, the structure is stable, but if it falls outside it is unstable.

In the present case we proceed by finding the point *a* at which the line of the wind pressure P intersects the line of action of the weight W of the wall. We then set down a length *a b* vertically to a convenient scale to represent 504 lb.—the value of W.

We next set out the line *b c* horizontally, to represent to the same scale 120 lb.—the value of P.

We then join *a c* which represents to scale the resultant force R on the wall and is often called the line of pressure; some people call it the equilibrium line. In this case the line of pressure comes outside the base, and so we say that the wall is unstable.

(2) By considering the point *x* about which the wall tends to turn and seeing whether the leverage (or moment as it is called in this branch of dynamics) about this point of the forces tending to overturn the structure is greater or less than the moment of the forces tending to keep the wall stable.

The pressure P is the only force in this case tending to overturn the wall, and its moment about the point *x* is measured in pound-inches by multiplying 120 lb. (the value of the force) by 36 in. (the "arm" of the force, that is the perpendicular distance from the point *x* to the line of action of the pressure P).

This gives us:

Overturning moment $=120\times36$
$=4320$ lb.-in.

The force tending to keep the wall stable is the weight W, the moment of which about the point *x* is obtained by multiplying 504 lb. by 4.5 in.

This gives us:

Stability moment $=504\times4.5$
$=2268$ lb.-in.

This is less than the overturning moment so that we say that the wall is not stable.

In masonry structures built up of blocks it is a general rule that the adhesive tension of the mortar shall not be relied upon for securing stability, and so we say that the above wall is unstable in spite of the fact that walls of this dimension can be found which manage to stand up. We will consider later how we could allow for the adhesion of the mortar if it were decided that it is safe.

In practice such a wall may never have had such a pressure due to wind as we have assumed, although the value which we have taken is less than that usually specified; moreover, cross-walls and counterforts would add to the stability.

THE BUILDING TRADE.

THE COST OF BUILDING.

By T. P. BENNETT, F.R.I.B.A., Hon. F.I.O.B.

THE following is the conclusion of the series of articles on *The Builder* Cost of Building Competition. Other articles appeared in our issues for December 7 and 14, 1923:—

The study of the forms giving the cost of materials is interesting, firstly, because it shows a certain stability in the cost of most materials, and secondly, because the variations in cost seem to have little or no relation to the completed tender. If reference is made to the chart already reproduced it will be seen that bricks and cement, while showing certain fluctuations in price, produce graphs that are horizontal in character, and do not rise and fall with the graph of tenders reproduced below it. In both graphs the position of the relative tenders is the same. Lime shows perhaps rather greater movement than cement, as might be expected from the fact that it is produced locally, and is not subject to the controlling influence of the cement interests. The items which vary most in the schedule are those relating to goods which are normally given as p.c. items, as indicated by the graph for the kitchen range reproduced on December 14. It is natural that these prices should show marked differences because of the opportunity for variation in quality and finish, but this would hardly seem to account for the very large differences which are apparent. The requirements of cottages have now become well known, and in the ordinary way it would seem natural to expect that the type of range, bath, w.c., etc., would have became standardised. Again, it will be seen that the cost of these items has little influence upon the final tender.

In the case of the range specified for type "A" the extreme prices are rather surprising because they extend from £3 to £20. It is difficult to imagine that an efficient 3 ft. grate can be obtained for £3. The range supplied by the winner was priced at £10 10s. £20 seems an unnecessary extravagance, and one of which few builders would be guilty.

The materials scheduled by the winners were to be obtained locally, with the following exceptions:—Bitumen, Wm. Briggs & Sons, Ltd., Dundee; gas copper and boiler, Rownson, Drew & Clydesdale, Ltd., London; tiles, Hawkesbury & Bedworth Brick and Tile Co., Bedworth; stoneware pipes, Kendrick, Wellington, Salop; manhole covers, Hatton, Sons & Bore, West Bromwich; bricks, Willenhall Brick Co., Willenhall.

The result of a close examination of the prices of materials is to suggest that there are differences in different localities, and that there is ample scope for good buying, but any gain under these headings is a means of providing a margin of profit for the builder rather than a matter of substantially reducing the cost of the building.

After examining the cost of materials in conjunction with the tenders the conclusion arrived at is that the following are the chief causes in determining the level of the final price:—

(1) The standard of workmanship.
(2) The efficiency of labour and management.
(3) The amount of the allowance for overhead charges and profit.

Under (1) there can be no doubt that the quality of the work put into a small house is susceptible to very big differences, and that in all probability the kind of house that would be built for the amount of the highest tender (£2,158 15s. 5d.) would be very different from that which would be built for the lowest. Inasmuch as it is very difficult to lay down an exact permissible quality the standard allowed becomes a matter of judgment upon the part of the architect, and of the reputation of the building firm concerned. The lowering of the standard of the building is undoubtedly the principal reason why speculative houses are sometimes cheaper than those designed for the personal occupation of a client, and also one of the reasons why Council houses erected by unknown builders can sometimes be quoted in the press at quite impossibly low figures.

(2) Many of the differences in price arise from the efficiency of the firm and of their workmen. Where, as happens in some cases, employees are kept on from year to year, and especially where they in some way share the prosperity of their employers, it is reasonable to anticipate that there is an improvement in their output. Similarly, when most or all the operatives are skilled craftsmen, they not only produce better work but they work much faster. This increased efficiency is probably the reason for the somewhat curious fact that all the lowest tenders except one were from districts where the highest rates for labour are paid. This means that, broadly speaking, the good men migrate to the well-paid districts, and that one result of their skill is the production of work that is more economical than that of the duller and slower men who remain behind. Incidentally it should be a powerful factor in inducing employers to take a keen interest in the training of apprentices. It must, however, be borne in mind that "A" grade towns in general have much better facilities for the supply of materials than is the case in country districts. Management in building as in all other types of business is, of course, an important factor, but is again one which, while it is a source of profit to the builder, and enables him to take on work at a low price without loss, does not substantially lower the cost of building.

(3) Allowances for overhead charges must of necessity vary with the size of the firm executing the work and the amount of the profit. On the other hand a substantial business implies better buying facilities and more intelligent management and organisation. These factors are of relatively greater importance on a large than on a small contract, and consequently they become an important asset in reducing the cost of big works, but possibly do not have full scope on small ones.

A specific query was sent to the builders who sent the 30 lowest tenders, with the following questionnaire:—

1. Did the issue of bills of quantities cause an increase in the tender?
2. What variations in accordance with local practice would have reduced the cost?
3. What other modifications would you suggest in the design or specification with a view to reduction in the cost?
4. Do you consider the accommodation provided suitable for working-class houses in your district?

Thirteen builders have replied up to date, and in answer to query (1) six replies state that quantities do increase the tenders, and have done so in this case, and six state that quantities do not increase the tender, while one makes no reference to the question at all. There appears to be nothing to confine the above decisions to any one class of builder or locality; but although quantities must save the builder a certain amount of work it is safe to assume that there is some ground for the belief that quantities cause higher tenders on small work.

In answer to questions (2) and (3) the following are the most important suggestions made:—

TYPE "A" HOUSE.

Omit inodorous felt and roof boarding.

Half-brick manholes. Omit curb. Use half salt-glazed channels in lieu of three-quarters white.

Wood boarded or granolithic floor in lieu of tiles.

Omit roof boards and batten roofs only.

Use ⅞ in. floor in lieu of 1 in., and omit mitred borders to hearths.

Omit part of shelving, all pipe grounds and drawers to cupboards.

Use R.W. strength instead of L.C.C. for waste pipes.

12 COMPETITORS IN "COST OF BUILDING" COMPETITION.

Class "A."

	No.	Name.	Town.	Amount.
Prize	47	William Roe	Wolverhampton	£1,195 11 4
1	117	Robinson & Sons	Swannington	1,122 18 0
2	145	Shilton & Co., Ltd.	Coventry	1,127 10 6
3	120	P. C. Sayer	Witham	1,144 12 7½
4	119	R. A. Evans & Co., Ltd.	Lowestoft	1,177 19 2
5	40	A. Sanders & Sons	Exhall	1,188 6 9
6	161	J. G. Richmond	Darlington	1,194 4 11½
7	95	T. Mortlock & Son	Willingham	1,200 0 0
8	138	A. Anderson	Newcastle-on-Tyne	1,215 6 0½
9	107	Stephen Heath & Son	Newcastle, Staffs.	1,241 13 5
10	67	S. S. Ambrose & Son	Ely	1,246 6 4½
11	147	I. G. Richards	London	1,249 18 11
12	162	H. Cooper	Maltby	1,254 8 5

Class "B."

	No.	Name.	Town.	Amount.
Prize	145	Shilton & Co., Ltd.	Coventry	£1,560 10 7
1	21	Newcombe & Co.	Cardiff	1,599 9 2
2	162	H. Cooper	Maltby	1,607 2 2
3	119	R. A. Evans & Co., Ltd.	Lowestoft	1,621 10 8
4	161	J. G. Richmond	Darlington	1,621 12 9
5	47	William Roe	Wolverhampton	1,623 7 8
6	120	P. C. Sayer	Witham	1,625 16 9½
7	147	I. G. Richards	London	1,658 17 6½
8	107	Stephen Heath & Son	Newcastle, Staffs.	1,661 3 7
9	122	G. & J. Browell	Blaydon	1,667 2 1½
10	117	Robinson & Sons	Swannington	1,677 2 0
11	34	W. J. B. Halls	Gloucester	1,693 5 5
12	67	S. S. Ambrose & Son	Ely	1,713 10 11½

Omit all hot water work and lavatory basins.

Replan first floor and put bath in scullery and so save bathroom.

TYPE "B" HOUSE.

Use 3 in. surface concrete in lieu of 4 in. and 5 in.

Corbelling to manhole in lieu of concrete slab.

3½ in. by 2 in. in lieu of 4 in. by 2 in. rafters.

3½ in. by 2 in. in lieu of 5 in. by 2 in. ceiling joists.

1½ in. by 1 in. battens in lieu of feather edge boarding.

Reduce overhang of eaves from 15 in. to 9 in.

Reduce casements from 2 in. to 1¾ in.

Two-inch internal breeze partition in lieu of 3 in.

Omit hot water.

Omit plaster panels and trellis.

A number of competitors raised most of the points mentioned.

In particular, Mr. J. G. Richards, of 15, Ladbroke-square, London, W. 11, Mr. J. A. Davison, of West Malling, Kent, and Messrs. Shilton & Co., Ltd., of Little Heath, Poleshill, Coventry, sent very carefully considered replies.

Others, notably Messrs. Bunn & Green, of Berkhampstead, Herts, and Messrs. Green & Bird, of West Hill, Hednesford, Stafford, have given the matter much consideration, but had fewer comments to make.

Many replies considered the type of house called Type "A" quite suitable in the districts of the writers; several, however, thought them superior to others in the district, and many commented upon the need for modifications to reduce cost. Type "B" was considered generally to be too large.

As to drastic reductions in cost these can only be made by the substitution of semi-permanent for more solid construction, as, for example, the use of No. 2—3 in. breeze slabs with iron ties for 11 in. hollow brick walling, which would probably save £50 per house or £100 for the pair. "Eternit" slating for tiles would save about £20, and still leave quite a habitable building.

The important points which arise from this competition and its results may, therefore, be summarised as follows:—

1. Economical design is of the utmost importance.

2. Housing enthusiasts are still endeavouring to demand a standard of accommodation far in advance of that which a working man can afford, and that in order to build with a view to creating an economic rent the amount of accommodation must be substantially reduced.

3. That the lowest possible price at which substantially built cottages can be erected at the present time is from 10½d. to 11½d. per cubic foot.

4. That this translated into floor area should be about 11s. to 11s. 6d.

5. That these prices are only possible with the strictest possible economy and with low tendering, and on an average will probably be 11d. to 1s. 1d.

6. That a semi-detached house containing a living-room, scullery, sitting-room, three bedrooms, and bathroom will cost at least £595, if solidly constructed in brick with a tiled roof.

7. That a house containing two sitting-rooms, kitchen, scullery, four bedrooms and bathroom will cost at least £777.

8. That in practice these figures may quite easily be exceeded since practically all the tenders are above these amounts, and would show on an average prices of £650-£700 and £825-£875 10s. respectively.

9. That no district in the country shows any marked economy compared with other districts, and that it is as dear to build in the provinces as in London.

10. That towns paying "A" grade wages can build as cheaply as those paying lower wages, because the best men tend to migrate there and because the "A" towns have a much better market for the supply of materials, while haulage is less, and overhead expenses may be proportionately less.

11. That clerical errors are very prevalent and often serious in building tenders.

12. That nearly 75% of the cost of a building is absorbed by the "Bricklayer," "Carpenter," "Plumber," "Painter," and "Glazier."

13. That the greatest variations in price occur in these trades with an emphasis upon the "Carpenter."

14. That the carcassing of these houses accounts for about 88%, and of the most economical cottage imaginable 92% of the entire cost, and that these items are quite unalterable without abandoning the principle of building a permanent fire-resisting structure.

15. That the price of materials is fairly steady, and while affecting the general level of building costs is not the primary cause of variation in the amount of the tenders for an individual building.

16. That prime cost items vary substantially.

17. That probably the efficiency of the workman and the standard of the work are the principal factors in determining the relative cost of buildings.

18. That bills of quantities probably tend to increase tenders for small houses.

19. That houses can only be built at amounts substantially below the figures quoted if they are of a semi-permanent or temporary character.

These results are of considerable importance to the study of building costs, and there can be no doubt that *The Builder* competition has added very materially to an accurate appreciation of the present cost of building, a result upon which the promoters (Messrs. Rownson, Drew & Clydesdale, Ltd., 225, Upper Thames-street, E.C., and *The Builder*) deserve the thanks of the whole industry.

Models of the designs have been made for *The Builder*, and at the present time can be seen at the showrooms of Messrs. Parsons, and already houses are being erected from the architects' designs, under their supervision.

In the lists on page 77 are given the amounts of the tenders of the winners, after adjustment for clerical errors, and the amounts of the twelve nearest competitors in each competition without such adjustment.

Geysers Without Ventilation.

Recently two inquest verdicts of death from poisoning by carbon monoxide, through a window being closed while a person was having a bath, in which a geyser was being used, were returned. These made five or six deaths from the same cause that had occurred in Bristol recently The Bristol Medical Officer of Health recently strongly recommended means of ventilation which would operate mechanically when a geyser was was in use.

COMPARISON OF PRICES OF BUILDING MATERIALS IN JANUARY, 1923, WITH CURRENT PRICES.

WE again have pleasure in publishing a table giving the prices of the principal building materials at the present time as compared with the prices for January, 1923. We are glad to say that there has been a steady fall in nearly all the markets.

Material.	£ s. d. Jan., 1923.	£ s. d. Jan., 1924.	% Fall.	% Rise.
Bricks—				
Best Stocks	4 2 0	3 19 0	3.66	—
Flettons	3 1 0	2 13 3	12.70	—
Glazed	22 0 0	22 0 0	—	—
Thames ballast	0 13 6	0 10 6	22.22	—
Thames sand	0 16 6	0 15 6	6.06	—
Shingle (¾ in.)	0 14 0	0 14 0	—	—
Portland cement	3 3 0	2 18 0	7.94	—
Ground blue lias lime	2 18 6	2 13 6	8.55	—
Grey stone lime	2 16 6	2 10 9	10.18	—
Bath stone	0 2 11	0 2 9½	4.29	—
Portland stone	0 4 7	0 4 4	5.45	—
Good Sound Building Timber—				
4 in. × 11 in.	34 0 0	34 0 0	—	—
3 in. × 7 in.	22 10 0	26 0 0	—	15.55
3 in. × 11 in.	32 10 0	34 0 0	—	4.62
2 in. × 11 in.	32 10 0	34 0 0	—	4.62
2 in. × 7 in.	22 10 0	26 0 0	—	15.55
3 in. × 4 in.	21 0 0	24 0 0	—	14.29
Slates—				
24 in. × 12 in.	41 17 0	37 12 6	10.10	—
22 in. × 12 in.	38 0 0	34 0 0	10.52	—
R.S. joists	13 0 0	13 10 0	—	3.85
Iron—				
Common bars	12 10 0	13 10 0	—	8.00
Mild steel bars	12 0 0	12 10 0	—	4.17
Steel bars	12 0 0	13 0 0	—	8.33
Cut nails	21 10 0	20 10 0	4.65	—
Sheet lead	35 10 0	41 10 0	—	16.90
Glass—				
15 oz. sheet	0 0 2¾	0 0 3⅜	—	22.73
21 oz. sheet	0 0 4⅜	0 0 5	—	8.11
26 oz. sheet	0 0 5¾	0 0 6	—	4.34
Raw linseed oil	0 3 7	0 4 0	—	11.63
Turpentine	0 8 9	0 6 6	25.71	—
Ground English white lead	55 5 0	56 5 0	—	1.81
White lead paint	77 10 0	79 10 0	—	2.58
Red lead	39 0 0	43 0 0	—	10.26

REINFORCED CONCRETE GRAIN SILOS AT AVONMOUTH.

THESE silos were erected by the Co-operative Wholesale Society's Building Department, London, to the design of their architect for the Southern District (Mr. L. G. Ekins, F.R.I.B.A.).

The building is practically square on plan, the dimensions being 93 ft. 3½ in. by 92 ft. 7 in., and has a storage capacity of 447,000 bushels (13,000 tons) of grain. The height from ground level to roof is 132 ft. 6 in., and above this a tower extends for a further 16 ft., making the total height 148 ft. 6 in. A sprinkler tank of 20,000 gallons capacity is contained in the tower. The height of this building will be realised when it is remembered that the height of the Nelson Column in Trafalgar-square is 150 ft.

All grain is moved by belt conveyors and elevators, supplied by Messrs. Spencer & Co., of Melksham, Wilts; the milling plant is being supplied by Messrs. Robinson & Sons, Rochdale.

As the ground was too soft to carry the loads required, all the foundations were carried by 14 in. by 14 in. by 55 ft. reinforced concrete piles, which were driven to a set of from ½ in. to 1½ in. in ten blows, and were calculated to have a carrying capacity of 50 tons per pile. In all 575 of these piles were driven, in groups varying from four to twelve. The soft nature of the ground will be evident from the fact that the result of the pile-driving was to raise the level of the site and adjoining land by 2 ft. Very little difficulty was experienced in the driving, as all piles took their set at practically the same depth. The heads of the piles were broken up and a reinforced concrete cap cast round each group to form a base for the reinforced concrete columns supporting the structure. The space between the caps is covered by a 6 in. reinforced concrete floor.

All interior columns are octagonal to bin-bottom level, whilst the face of the external columns project beyond the external walls in conformity with the architect's requirements. It was decided to make the underside of the bin-bottoms level so as to minimise the cost of centering.

The bins are 60 in number, the dimensions of 36 being 11 ft. 9 in. by 12 ft. 6 in., centre to centre of walls; while the remaining 24 are 5 ft. 10½ in. by 7 ft. 8¼ in. centre to centre. The walls of the larger bins are 7 in. thick throughout; and those of the smaller bins, 5 in. Each bin is 100 ft. in depth from top to bottom.

Wooden centering was used throughout, the forms being raised as the work proceeded. All mixing of concrete was done by mechanical means, and the mixture was hoisted up an "Insley" steel mast hoist and fed by gravity to the position required. The concrete for the columns below the bins is a 1 : 1 : 2 mixture; while a 1 : 2 : 4 mixture was used for the columns above the bottoms of the bins.

The bin tops are covered with reinforced concrete slabs, 6 in. thick, which form the bandway floor. An opening 2 ft. square is left

Reinforced Concrete Grain Silos at Avonmouth. MR. L. G. EKINS, F.R.I.B.A., Architect.

in the top of each large bin, and 1 ft. 6 in. square in each small bin. Belt conveyors carry the grain over the floor to the bins.

This floor is covered by a reinforced concrete roof, which extends over the whole building, light being provided by three large lantern lights. A covering of asphalte is given to the roof, and falls are obtained by varying the height of columns as necessary.

The east end of the building holds the elevators and milling machinery, carried on reinforced concrete floors. Elevator rooms are provided at the north-east and south-east ends of the building to carry the hoisting machinery; whilst a large balance bin occupies the north-east corner from the ground level to the fourth-floor level. A smaller balance bin occupies the south-east corner from the fourth to the bandway floor level.

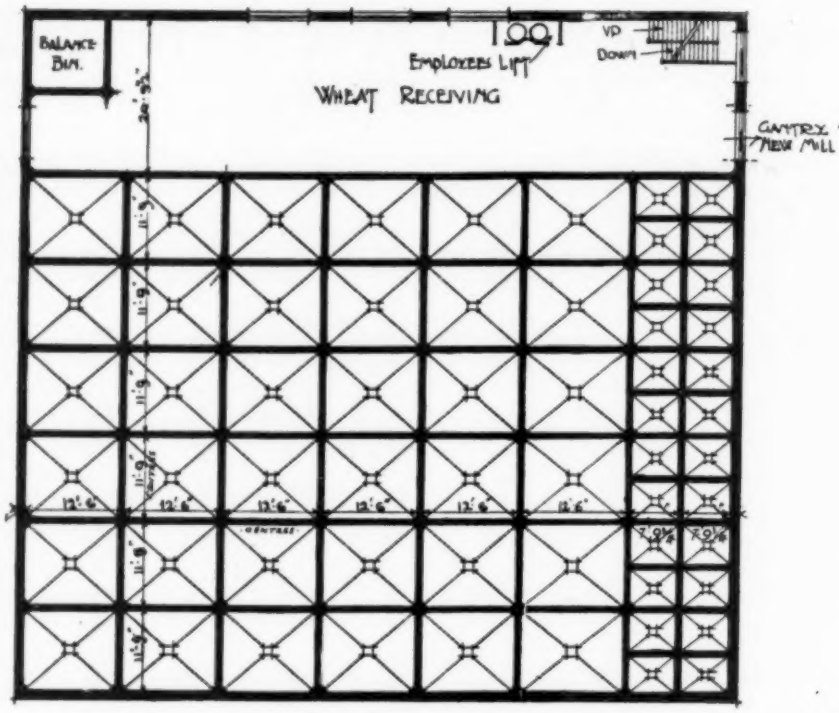
External walls are in reinforced concrete, 7 in. thick, panelled on the external face. The wall surfaces are finished without any skimming coat of cement and sand, and are left as from the shuttering.

All steel is to British standard specification, and consists of round bars of mild steel.

A tunnel extends from the railway siding to the underside of the elevators to carry the belt conveyor, which conveys grain from trucks to the bins. This tunnel is 229 ft. 2 in. in length, 7 ft. wide, and 7 ft. 3 in. in height, and is supported by 21 piles, 14 in. by 14 in. by 50 ft.

The whole of the reinforced concrete work for this structure, which comprises the main grain store in connection with the Co-operative Wholesale Society's large flour mill adjoining, was designed by Messrs. Edmond Coignet, Ltd., reinforced concrete engineers, of 125, Gower-street, W.C. 1.

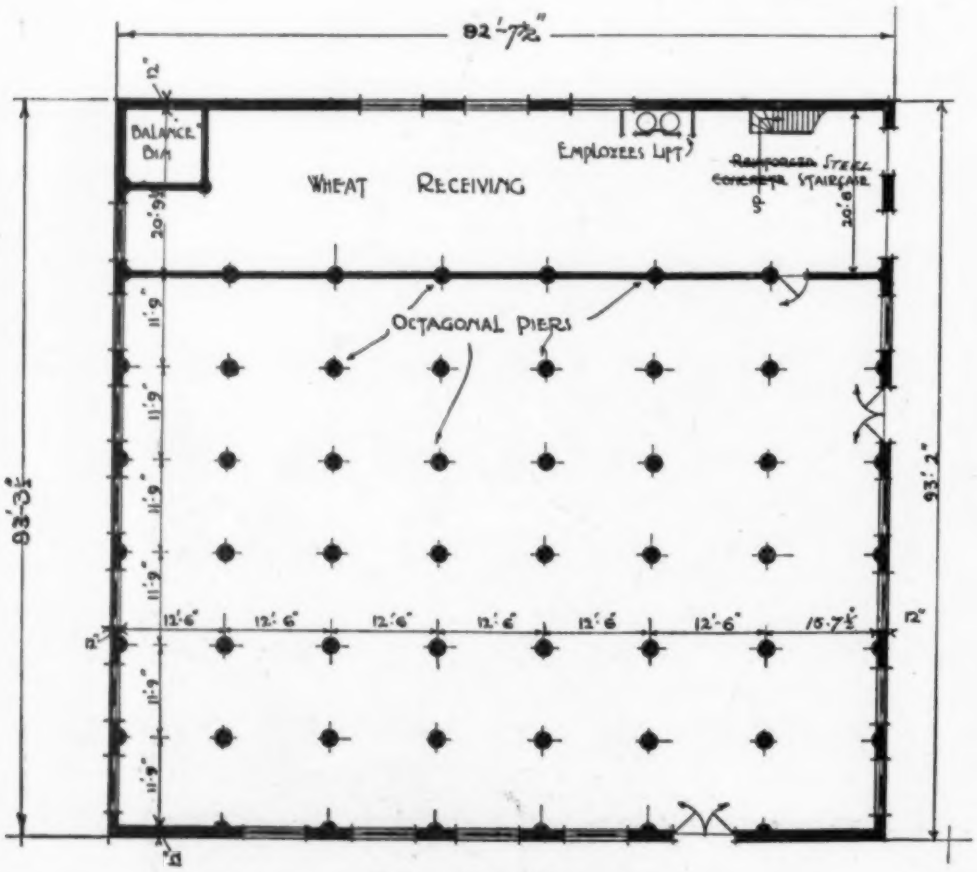
Messrs. Hartley & Sugden are opening on February 1, 1924, new offices and extensive showrooms at 215, Tottenham Court-road, London, W. 1 (telephone, Museum 214), and will have at these premises a most extensive range of boilers, heating appliances, and "Thermostoves." The general public, also the trade, are invited to call and make an inspection.



PLAN THROUGH SILOS.

STAFF DINNER.

"A HAPPY New Year party" is perhaps the best description of the annual dinner of Messrs. A. Roberts & Co., Ltd., builders, of Earl's Court-road, Kensington, held at the Café Royal, Regent-street, on Thursday last week. This firm is justly proud of the cordial relations which exist between the directors, the staff, and the employees, and if, as we have no reason to doubt, the good fellowship between all concerned so much in evidence on this occasion is present throughout the everyday routine of office and job, the firm is indeed to be congratulated. Mr. G. S. Roberts, who occupied the chair, likened the firm to a guild in which capital and labour formed a brotherhood for the betterment of the craft and the provision of good buildings, and Mr. M. C. Doll, M.A., A.R.I.B.A., testified to the success accompanying work carried out on this principle by describing the excellent workmanship put into some recent buildings carried out by the firm; he had, he said, always found the operatives most interested in their work, and anxious to give of their best. Mr. E. J. Brown (Director of the London Master Builders' Association) also referred to the spirit of co-partnership which existed throughout the firm, and pointed out that it was only by trying to see "the other fellow's point of view" that difficulties could be understood and remedied. Mr. H. W. Capper, Mr. F. E. Nunnerley, Mr. A. Roberts, Mr. A. J. H. Sprague, F.S.I., Mr. M. V. Ely, and Mr. P. Roberts also spoke between the items in an excellent after-dinner musical programme.



GROUND FLOOR PLAN.

Reinforced Concrete Grain Silos at Avonmouth. MR. L. G. EKINS, F.R.I.B.A., Architect.

OBITUARY.

The death occurred recently at Ilfracombe, of Mr. Oswald M. Prouse, A.M.I.C.E., for 32 years engineer and surveyor to the Ilfracombe Urban District Council.

The death occurred at Weldon House, Barnard Castle, on December 25, of Mr. Wm. Appleby, aged 81 years, a retired builder and contractor.

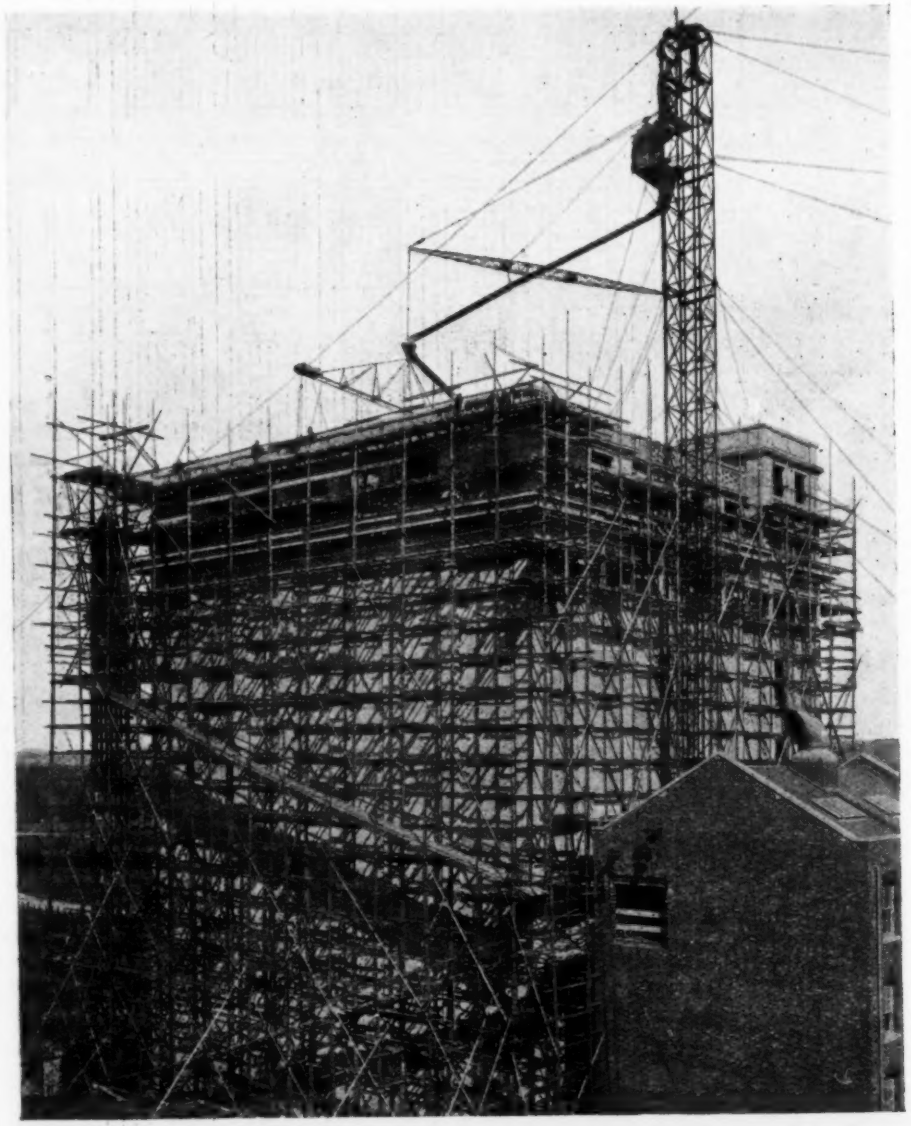
Mr. Donald M. King, joint managing director of Messrs. David King & Sons, Ltd., of Keppoch Iron Works, Possilpark, Glasgow, died suddenly at his residence on December 22 last. Mr. King had been associated with the firm from its inception in 1874, when the business was first established by Mr. David King, senr., and John King, J.P. (now Chairman of the National Light Castings' Association).

The death has occurred of Councillor Arthur F. Young, aged 68, who, prior to his retirement eight years ago, carried on for many years the business of a builder. Councillor Young was Mayor of Sunderland for the two years, 1908-10, a borough magistrate, and a director of the Sunderland Industrial and Provident Building Society.

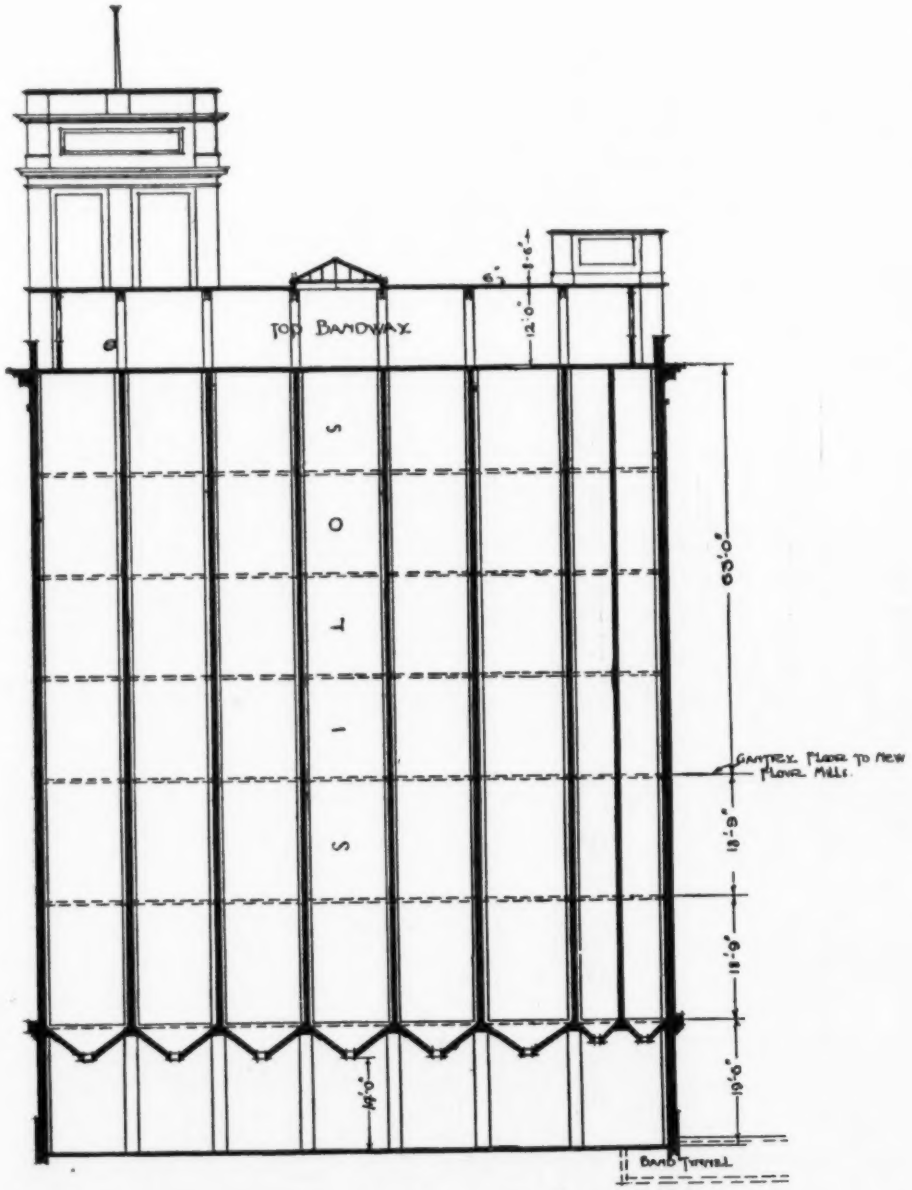
The death has taken place of Mr. John George Sayce, builder and contractor, Newport (Mon).

An Epstein Exhibition.

An exhibition of new sculpture by Jacob Epstein will be held during this month at the Leicester Galleries, Leicester-square.

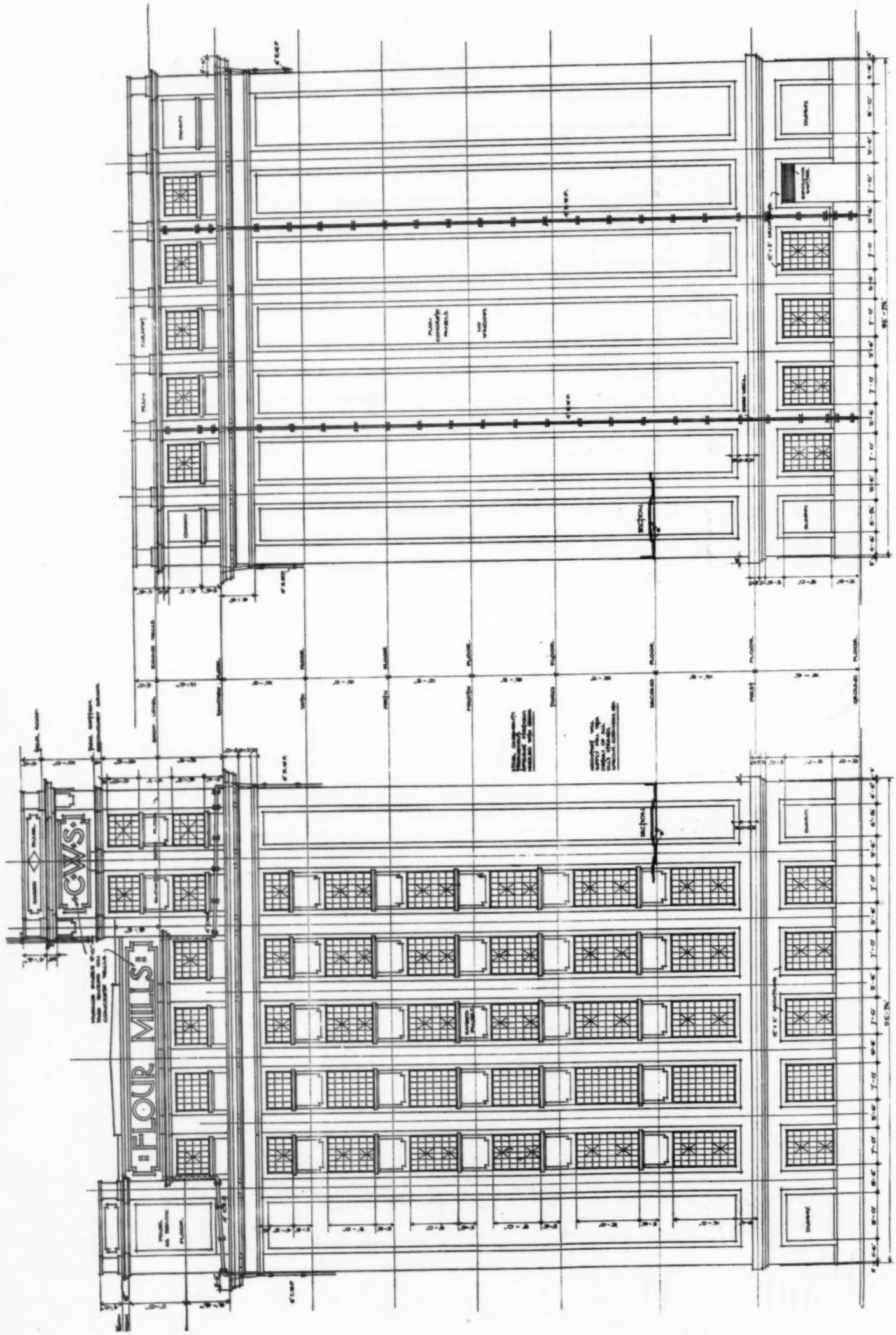


DURING CONSTRUCTION.



SECTION.

Reinforced Concrete Grain Silos at Avonmouth. MR. L. G. EKINS, F.R.I.B.A., Architect. (*See p.* 79.)



WEST ELEVATION.

EAST ELEVATION.

Reinforced Concrete Grain Silos at Avonmouth, for the Co-Operative Wholesale Society, Ltd. MR. L. G. EVANS, F.R.I.B.A., Architect. (*See p. 79.*)

ADVANTAGES OF THE NEW STEEL JOISTS.

BY M. B. BUXTON, M.A.

THERE are at the present moment a vast number of schemes for the building of factories, offices, and flats which have never been actually commenced owing to the fact that the cost has not been brought down to what the promoters consider a paying proposition. The problem of lowering the cost of building materials and construction is of great importance, not merely in order to benefit those who wish to use the buildings when completed, but in order to alleviate to some degree the great amount of unemployment at the present time by profitably employing capital, brains, and labour in the promotion of commercial enterprises.

We have really to learn to make the best use of what we have at our disposal, and since in every large scheme steelwork plays an important part it is well that we should see if there are not means which could be used, and which in fact are being used by the more progressive architects and engineers to reduce the cost of work.

At the moment there is a very large selection of steel joists available, those of British Standard Specification 1904 range being still in use, while the New British Standard sections which were standardised in 1920 are now available. It is the latter sections which can help to a great extent at the moment to lessen the cost of building construction. A superficial glance at a list of the new sections and comparison with the old may not lead to any great appreciation of their value. But if the question be carefully studied we shall discover some surprising facts. In these sections we have a far better range of strengths of weights and shapes to carry the loads met with in ordinary building practice.

The metal in the section is placed to the greatest advantage in accordance with the latest ascertained scientific principles as far from the neutral axis of the beam as is practicable. Take, for instance, a joist weighing 30 lb. per ft. run: The problem is to so arrange the metal that we have the greatest load carried and yet a web stiff enough to resist the shear stresses. The old range gives us the 10 in. by 5 in. at 30 lb., which has a modulus of section, or measure of strength, of 29.12 in.^{3}, and can carry a distributed load of 7.2 tons on a span of 20 ft. with a factor of safety of 4. On the other hand, the new range of sections has a beam weighing 30 lb. per ft. of section 12 in. by 5 in., which has a modulus of section of 34.48 in.^{3} and can carry 8.6 tons distributed on a 20 ft. span. Thus for the same cost of metal we have a beam which is about 16 per cent. stronger.

Certain people are misled by seeing that some new sections are of similar weight and dimensions as the old, *e.g.*, 6 in. by 3 in. at 12 lb., 8 in. by 6 in. at 35 lb., 9 in. by 4 in. at 21 lb. In every case closer examination reveals a better disposition of the metal, with a proportional increase of strength.

There is also a far better range to choose from than in the old list of sections. In the latter the weights and moduli of section seemed to be haphazard, and we find joists weighing 28, 32, 35, 42 lb., for example. In the new the joists increase in weight by 5 lb. from 20 to 90 lb., so we have joists weighing 25, 30, 35 lb., etc., with moduli increasing gradually and in more regular series. Incidentally it is clear that the weights, being in multiples of 5, much labour is saved in arriving at the weight of steel when estimating.

There are also some most excellent new forms of section, the 13 in. by 5 in. at 35 lb., the 18 in. by 6 in. at 55 lb., and the 20 in. by 6½ in. at 65 lb., to cite a few examples. If, for instance, a beam to support a load of 23 tons on a span of 20 ft. with a factor of safety of 4 is required, a modulus of 92 in.^{3} is necessary. The choice would be between, in the old list, either a 16 in. by 6 in. at 62 lb., which only supports 22 tons, and so is really too weak, or an 18 in. by 7 in. at 75 lb., which is too strong. In the new range we have a beam of modulus 93.5 in.^{3}, viz., 18 in. by 6 in., able to take slightly more than 23 tons, and only weighing 55 lb. as against 62 or 75 lb.

Looking at the list of old sections to see if we have a beam of about 55 lb. weight, we find one of 54 lb., the 12 in. by 6 in., and on calculating its carrying capacity on a span of 20 ft., we find it will only take 15 tons. So by utilising the 18 in. by 6 in. we have a clear gain of almost 35 per cent. in strength, weight for weight, through the more scientific disposition of the metal.

It is apparent that we have similar results when the new joists are used as compounds with plates riveted to the flanges. We find compound girders able to bear the loads with the required factor of safety weighing less than those made from the old sections.

We have so far confined our attention to joists used as beams. As to pillars or stanchions, suffice it to say that we have a wider range of heavy beams or pillars from which to make our selection, with the metal disposed in such a manner as to give a greater radius of gyration in the weaker axis. Many are of deeper section, as 12 in. by 8 in. at 65 lb., 14 in. by 8 in. at 70 lb., 16 in. by 8 in. at 75 lb., and so afford more space in the webs and on the flanges for connections of girders bearing upon them, thereby affording opportunities for economical design.

If anyone will take the trouble to compare a handbook giving carrying capacities of the old joists with a handbook giving those of the new joists he will find that these few examples discussed here will be multiplied considerably.

The important question will naturally occur in the reader's mind as to whether these new sections rolled are available for general use. Joists are made from the steel ingots by gradually rolling them first in a cogging mill and then in a finishing mill into the finished dimensions. The finishing mill really resembles in principle the well-known household mangle, the steel being squeezed between two rollers on which the profile grooves are made, so that the shape of the section required is produced. It can be readily understood that these rolls will gradually wear or may possibly be broken, so that new rolls are required. The steel manufacturers have agreed that as the rolls of the old sections wear out rolls to replace them will be cut to the profile and dimensions of the new sections.

Almost every steelworks now rolls some of the new sections, and one large works has an almost complete range of them. Therefore there is no difficulty in purchasing the majority of them, and they are constantly now being utilised by architects and engineers, who are fully alive to the need of having the most efficient and economical scheme of steelwork for their buildings and factories.

Proposed Rural Libraries.

It is proposed to found several rural libraries in the North Riding area, and the E.C. have been instructed to prepare and submit a scheme for the adoption of the Public Libraries Acts 1892–1919, and application be made to the Carnegie Trustees of a grant.

INSTITUTE OF BRITISH DECORATORS.

"Fresco Painting."

MR. J. H. SEXTON gave a lecture on this subject at Painters' Hall, Little Trinity-lane, E.C., recently.

In the course of his remarks he said that fresco painting comprised one of the oldest forms of mural decoration. Certain forms of fresco were used by the Egyptians in their tombsin prehistoric times; Prof. Flinders Petrie put the date at from 8,000 to 5,800 B.C., and wall paintings discovered during excavations at the Palace of Knossos, on the Island of Crete, probably dated from about 1,500 B.C., but the greater development of the art began in Italy in the thirteenth century.

The Italians, however, increased its scope and possibilities; and it gained significance from the fact that it was more permanent than tempera or oil painting.

There were, the lecturer said, three processes of fresco painting: Buon, Secco, and Spirit. The first consisted of painting, whilst the plaster was still wet, with simple colours; the second painting after the plaster had been allowed to dry: it was similar to tempera painting. The third was an altogether different process, and consisted of the work being done on a specially prepared ground when it was dry, with material of which resin and white wax were essential ingredients.

Theorists differed as to the composition of buon fresco; according to some authorities the lime should have been slaked at least a year before using, and the proportions of lime and sand half and half. Cennino Cennini, however, made no such stipulation, and merely stated that if the lime were very fresh and rich it would require two parts of sand to one of lime ground well together with water, and allowed to rest for some days until it was quite slaked.

Together with the necessity for having the lime well tempered, it was essential to have the right kind of sand—river sand.

The lecturer then said that simplicity in colouring and design was the chief thing to be aimed at.

It was stated when Michael Angelo was at work on the ceiling of the Sistine Chapel he was very much upset at the various changes the fresco underwent, in succession, when drying. He asked the Pope to be allowed to resign from his work, but he was referred to San Gallo, who explained the matter to him.

The necessity of working with freshly-made plaster must not be overlooked; also colours appeared much lighter in the process of drying, and the work must not be continued after crystallisation had once commenced. It was the practice in the sixteenth century, when a fresco had been commenced but not completed the same day, to finish it in secco fresco with size or egg medium.

The colours used in buon fresco painting were chiefly simple earths. The lecturer gave a list as follows: White, lime-white that had been kept for a long time; yellow, all kinds of ochres and red siennas; reds, all kinds of burnt ochres, burnt sienna, oxides of iron, and lake coloured burnt vitriol; browns, umber raw and burnt, and burnt terre verte; black, burnt cologne-earth; purples, burnt vitriol, cobalt blue and lake-coloured burnt vitriol; greens, verona green (terre verte), cobalt and chrome green; blues, ultramarine, cobalt blue and factitious ultramarine (this did not always mix well).

Vasari, in "Lives of the Painters," spoke of the qualifications most requisite to obtain success in buon fresco. They were dexterity, resolution and rapidity, combined with sound and perfect judgment; this judgment played an even more important part than drawing. Much practice was necessary as a guide, and it was extremely difficult to bring fresco work to perfection.

Cleanliness in working was very necessary, and brushes, &c., should be washed with turpentine at the end of the day.

MODERN BUILDERS' MACHINERY.

BY STAFFORD RANSOME.

I.—THE BUILDER AS A USER OF MACHINERY.

FROM the days when mechanical wood conversion began to rank as a commercial, or rather as an industrial, proposition, which may be put at about 150 years ago, the builder has been the best, if not the largest, customer of the manufacturers of woodworking machinery.

I say that he is the best customer for two reasons. First, he is the steadiest; he is always there and he is always growing individually and collectively. The small man becomes a big man, or perishes in the attempt, and his number is ever multiplying. Almost from the start he must have machinery of some sort—even if it is only a mortar mill, a saw bench, or a "general joiner." And a builder's plant may mean anything from a single machine up to a saw-mill and joiner's shop of very considerable size and of a peculiarly all-round capacity, even sometimes to the conversion of large logs of all sizes and qualities of woods. It is the multiplicity of these establishments, large and small, throughout every civilised country in the world, and the fact that builders, as a rule, work their machines very hard, that makes the demand for their requirements at once very large and constant.

A Direct Customer.

The second reason why the builder is welcomed of the manufacturer as a customer is because, as a rule, he knows what he intends to buy, though it does not necessarily follow that he always knows what would be the best thing for his purpose, and he goes direct to the maker and does not wish to introduce into the machines all sorts of special features, which may sometimes defeat their own end. Nor does he hamper the manufacturer unduly with penalty clauses and other galling restrictions.

On the other hand, the builder, at all events in the early stages of his career, often wants more latitude in the way of credit than is usual with other customers. After all, this is only natural, for the position of the small builder is much like that of the small farmer. Both are dependent on their crops and the contract is the builder's crop. His small capital is often strained to its utmost limit by the work and material which he has to put into the job before he gets his payments in, and the machinery, if it is to be of any use to him, must be forthcoming when the contract is started, just as the farmer must have his ploughing tackle months before his crops materialise.

As a rule, the respectable small man will find manufacturers who are prepared to accommodate him to some extent in this respect and, if bad debts are occasionally incurred in the process, they are generally of small amount and may be said, as a rule, to constitute a legitimate business risk. In short, the manufacturer and the builder understand each other's requirements and ways, and collectively the business done between them is considerable.

Stock Facilities.

Woodworking engineering firms, in this country, at all events, do not manufacture to any very large extent for stock as a general rule. Such of their machines, however, as are manufactured on this principle, may nearly all be classed as builders' tools. This is because the risk of that class of machine remaining on their hands for a lengthy period is far less than would be the case with others. The builder, too, is nearly always in a hurry for what he wants, because in the early part of his career the signing of a contract, which he may have to hurry through at high speed, may be the factor which alone would justify him in making his purchase, and he may not have known twenty-four hours before that event that he is destined to get this work.

The Influence of the Builder.

On the evolution of wood-working machinery the requirements of the builder and contractor have had a very great influence. Many hundreds of machines for sawing, planing, moulding, mortising, tenoning, boring, &c., have been designed and constructed primarily to suit his requirements, and it is no exaggeration to say that fifty years ago the trade publications issued by the various manufacturers of wood-working machinery were little more than catalogues of builders' plant. In them we found "contractors' frames" "contractors' saw benches," "general joiner for builders," and there would hardly be a machine in those earlier books which was not intended for the builder, or a page of the letterpress which was not addressed to him. That the makers in those days regarded the builder as their primary *objectif* is emphasised by the fact that, apart from their wood-working machines, they included in their catalogues such plant as stone-sawing and dressing machines, mortar mills and other tools which were of use only to the builder. Thus for generations the makers have catered particularly for the builder, and the builder has got into the habit of expecting to find what he requires, if not always actually ready-made, at all events deliverable at an early date from standard patterns.

The Builders' Requirements.

And what are the qualities he looks for in the plant he buys? Let us begin with the process of elimination. Except in the case of large builders we may, as a rule, cut out the conversion of logs. And yet many comparatively small builders are obliged to equip themselves for log sawing, because a builder never knows what quality of timber he may be called upon to use and, unless there are log mills in the neighbourhood, he may often find it necessary to do his own log sawing. We may also, as a general rule, eliminate from the builders' workshop those ultra high speeds in sawing and planing which are required in the general saw mills. This is because, although there is no user of machinery who at times requires to get the very utmost of production in a short time more than does the builder, those periods of rush in the machine shop are interspersed with periods of comparative stagnation. When such is the case he would not be justified in putting down saws which would cut at 200 ft. a minute, or planers that would cut at 300 ft. a minute, when his average requirements may be perhaps only a fifth or a tenth of that amount.

The special machinery required for the rush tactics adopted in these days in the larger general saw-mills working for the trade are only justified when a steady continuity both of demand for goods of a specific class and supply of materials for making them are both assured year in year out, and this is not the case in the ordinary builder's yard.

The Qualities of Builders' Machines.

The two great qualities that the average builder has to look for in his machines are: (1) endurance; and (2) versatility. The first is because he is often obliged to force the output unduly and to use his machines rather brutally in the process, and the second is because there is hardly an operation that is known in wood conversion that he will not be called upon to perform at one time or another by means of the machinery which he has at his disposal. This applies equally to the small man who has one or two machines, or to the large man who has twenty or thirty, and the selection of his machines is, therefore, a far more difficult problem for the former than for the latter, as is also the problem of continuity of work.

Extraneous Aid.

It is true that in these days very much of the woodwork which is put into the construction of the ordinary house by the builder is virtually prepared for the purpose before it reaches his hands. All the flooring and mouldings and most of the matchboarding, for instance, which are turned out systematically in the general sawing and planing mills are destined for the use of the builder, and much of this material need never be touched by his machinery beyond cross-cutting it to various lengths. Roofing timbers and joists may also be had cut to the required sections, and doors and window frames are imported ready made in huge and ever-increasing quantities.

This naturally simplifies the matter for the small builder, and greatly reduces the quantity of the machinery that he has to put down, but it in no wise reduces the number of different operations which his machinery will have to perform. This is because he has to work to specification, and that specification may or may not accord with the standardised dimensions of the articles available. Thus, as far as machinery is concerned, he must always be prepared at a pinch to make throughout any of the woodwork that may be required of him, even although he may expect to be able as a rule to purchase most of the material either completely formed or nearly so. This is because he cannot count with certainty on such being the case at all times. In fact, he knows not what to-morrow's contract may bring forth, and any deviation from the ordinary conditions may make the difference between whether the builder can purchase outside or must prepare his own material. Even so small a matter as a slight deviation in the contour of a moulding from accepted standards may affect this question very materially.

Question of Standardisation.

Though the standardisation of certain units in the cheaper class of house, and to some extent in the houses themselves, has been attempted, it has not gone very far in this or any other country except in Japan, where from time immemorial all the rooms and corridors and verandahs, and consequently the houses themselves, are built to multiples of the "tatami," or mat which carpets the floor, and is of a standard size (about 6 ft. by 3 ft.), and where rooms are always of a standard height. Thus a house which occupies an area of 900 sq. ft. would be described as a "50-mat house," and a room 15 ft. by 12 ft. as a "10-mat room." In that country alone would it be possible to adopt the principle of house building on the "Ford car principle," and although that policy has not been adopted it would be a comparatively easy matter in that country so to arrange matters that the whole of the wood-work, with the exception of the decorative work which varies, could be made throughout by mass production in large factories which would relieve the builder entirely of the purchase of machinery for his own use. Such an ideal state is never likely to exist elsewhere, and the individual builder must, therefore, employ machinery in varying quantities and of various types.

The Functions of Machinery.

And whether the plant be large or small he must be able to use it for sawing, cross-cutting, planing, moulding, recessing, trenching, mitreing, mortising, tenoning, boring, and, in fact, for nearly everything of which wood-working machines are capable. It often happens, too, that, quite apart from the conversion of material for building purposes, a builder, in order to work up his waste wood and make it a source of profit, may utilise certain special machines, such as those used for making paving blocks, wood-wool, firewood, or other readily saleable articles, which can be made from oddments.

Of the plant required by the builder, wood-working machinery is, of course, by far the largest factor, though he has also been a steady though small user of machine tools for metal work. A forge, a lathe and a drilling machine are all essentials to a builder's equipment when he has risen above the lower rungs of his ladder. These, and his faithful old friend, the mortar mill, with certain simple wood-working machines,

formed, thirty years ago, the whole of his requirements, mechanically speaking; but to these to-day have been added a multitude of modern machines such as pile-drivers, concrete mixers, asphalte plant, concrete slab machines, well-sinking tackle, pneumatic drills, and in some cases even road-making plant. Thus his requirements at the present day are both varied and extending, and the purpose of these articles is to show how his requirements can best be fulfilled and how his machinery can be utilised to the best advantage.

Machinery is Incidental.

We must always bear in mind that machinery, important and essential as it is to the builder, is, after all, one of a number of other factors which go to make up his business. It is, in fact, incidental to his calling and not the first consideration to occupy him to the exclusion of other matters. Unlike the saw-mill proprietor, who may be regarded as one who becomes an expert in saw-mill machinery from force of circumstances, because his living depends entirely on the efficiency of the machines he employs, the builder very often has not the time to devote himself to a close study of the question. This is because his main business is to erect buildings and carry out other important work from purchased materials, and any actual manufacturing of the units that he has to do is thrust upon him, and his machinery which enables him to do it is merely a necessary adjunct to his other work.

It is true that the ordinary sawmill owner has to purchase his timber; but he is a regular and steady customer and his purchasing may be reduced to a routine, and he can look ahead in purchasing. Not so is it with the builder, whose requirements for timber are often spasmodic and very varied. And in addition to his timber he has to buy everything under the sun in connection with his trade, even sometimes the land on which he builds. Over and above all this his brain and his time are primarily occupied in fighting for his contracts, financing them and carrying them out in all their intricate detail. Small wonder is it, therefore, that with all these anxieties he cannot always give that close attention to the purchase of machinery that is desirable. Consequently he frequently—especially in the early stages of his career—errs in the selection of his plant and fails to turn it to the best advantage when he has got it. Too often in this respect he is apt to follow an old-established practice, which may or may not be sound at the present day, and which may lead him into a policy in production which is neither efficient nor up to date.

These articles are intended to guide him out of that groove by discussing the evolution of the machines which he employs and by putting him in the way of obtaining the best results from the plant which is now available.

The Flavel Training School.

On December 28, the students of this institute spent an evening at the Flavel Social Club, Leamington. The chair was taken by Mr. Flavel; and Mr. W. E. Pengelly, the late head of the Weston Training School, gave a short address, in which he impressed upon them the very fine opportunity open to them for making a success of life, when they reached manhood. Mr. Flavel then explained the details of his scheme in founding the Training School, and pointed out the way for the students to obtain the full advantages offered. He appealed to the students carefully to assimilate the instruction given and so fit themselves to become really skilled tradesmen and useful citizens. The Superintendent of the Training School, Mr. F. P. Carr, then read the report, and thanked Mr. Flavel for all that he had done for them.

£10,000 Gift to Hospital.

The committee of the Kent County Ophthalmic Hospital, Maidstone, has received a donation of £10,000 from Mr. J. W. Wheeler Bennett, High Sheriff of Kent, for the extension and improvement of the institution.

RATES OF WAGES IN THE BUILDING TRADE.

The following are the rates of wages in the building trade in England and Wales. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	C'p'ters. Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
Aberdare	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Accrington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Altrincham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Ashton-under-Lyne	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barnsley	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barrow-in-Furness	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barry	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bath	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Bedford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Birkenhead	1/9	1/9	1/8½	1/9	1/9	1/9	1/8½	1/4
Birmingham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bishop Auckland	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Blackburn	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Blackpool	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bolton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bournemouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Bradford	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Brentwood	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Bridgwater	1/3	1/3	1/3	1/3	1/3	1/3	1/3	0/11½
Brighton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Bristol	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Burnley	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Burton-on-Trent	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Bury	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Cambridge	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Cardiff	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Chatham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Chelmsford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Cheltenham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Chester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Chesterfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Colchester	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Coventry	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Crewe	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Darlington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Derby	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Doncaster	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Dudley	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Durham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
E. Glam. (Mon. Vall.)	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Eastbourne	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Exeter	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/3½	1/0½
Folkestone	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	0/11½
Gloucester	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Grantham	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Grays	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/2½
Grimsby	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Great Yarmouth	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Guildford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Halifax	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Harrogate	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Hartlepools	1/7	1/7	1/7	1/7	1/7	1/7	1/7	0/11½
Hastings	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/0
Hereford	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/2½
Huddersfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Hull	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0½
Ipswich	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/1½
Lancaster	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Leamington Spa	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/2½
Leeds	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Leicester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Lichfield	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/2½
Lincoln	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/4
Liverpool	1/9	1/9	1/8½	1/9	1/9	1/9	1/8½	1/2½
Llanelly	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
London	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/2½
Loughborough	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Luton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Maidstone	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Manchester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Mansfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Merthyr Tydfil	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Middlesbrough	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Newcastle-on-Tyne	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Newport, Mon.	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Northampton	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/0½
Norwich	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/2½
Nottingham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0
Oakham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/2½
Oldham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0½
Oxford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/1½
Plymouth	1/6	1/6	1/6	1/6	1/6	1/6	1/5	1/2½
Pontypridd	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0½
Portsmouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/2½
Preston	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0½
Reading	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/2½
Rochdale	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0
Rochester	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/1½
Rugby	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
St. Albans	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/2½
St. Helens	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Scarborough	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/2½
Sheffield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Shrewsbury	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/0½
Southampton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Southend-on-Sea	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Southport	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
South Shields	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stockport	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stockton-on-Tees	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stoke-on-Trent	1/7	1/7	1/7	1/7	1/7	1/7	1/7	0/11½
Stroud	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3	1/2½
Sunderland	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Swansea	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0
Swindon	1/4	1/4	1/4	1/4	1/4	1/4	1/3	0/11½
Taunton	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/0½
Torquay	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Tunbridge Wells	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/2½
Wakefield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Walsall	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/2½
Warrington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
West Bromwich	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Wigan	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/0½
Windsor	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/2½
Wolverhampton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/1½
Worcester	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/2
York	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	

(For rates of wages in the Building Trade in Scotland, see page 91.)

CONTRACTS, COMPETITIONS, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in; the name and address at the end is the person from whom or place where quantities, forms of tender, &c., may be obtained.

BUILDING AND PAINTING.

JANUARY 12.—**Dewsbury.**—ALTERATIONS.—For alteration of Moorlands Hall, for the T.C. Borough Surveyor, Town Hall, Dewsbury.

JANUARY 14.—**Aberdeen.**—HOUSES.—For erection of four blocks of dwellings, each containing 48 tenements, for the T.C. Mr. J. Coutts, Housing Department, Town House, Aberdeen.

JANUARY 14.—**Buxton.**—CHIMNEY.—For the reconstruction of the hot baths chimney, The Crescent, for the T.C. Mr. F. Langley, Borough Engineer, Town Hall, Buxton. Deposit £2 2s.

JANUARY 14.—**Edgerton.**—HOUSE.—Erection of detached house in Talbot-avenue. Messrs. Abbey & Hanson, architects, 11, Cloth Hall-street, Huddersfield.

JANUARY 14.—**Edmonton.**—REPAIRS.—For repairs, 12, Queen Anne's-place, Bush Hill Park, Branch Library, for the U.D.C. Mr. Cuthbert Brown, Engineer, Town Hall, Edmonton, N.9.

JANUARY 14.—**Exeter.**—HOUSES.—Erection of 45 houses, for the T.C. City Architect, 2, Southernhay West, Exeter. Deposit £2.

JANUARY 14.—**London, N.6.**—COTTAGES.—Erection of 100 cottages, together with drainage and fencing at Coppett's-road, Muswell-hill, for the Town Council of the Borough of Hornsey. Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Town Hall, Highgate, N.6. Deposit £2.

JANUARY 14.—**Oldbury.**—HOUSES.—Erection of 20 non-parlour type houses in Queen's-road, for the U.D.C. Mr. Roland Fletcher, Surveyor, Public Buildings, Oldbury.

JANUARY 14.—**Pulborough.**—FENCING.—Provision and erection of fencing on Hatches Estate, West Chiltington, near Pulborough, for the West Sussex C.C. Director of Agriculture, Southgate House, Chichester.

JANUARY 14.—**Rawtenstall.**—HOUSES.—Erection of 48 houses, for the T.C. Mr. A. Brocklehurst, St. James's Chambers, Waterfoot. Deposit £3 3s.

JANUARY 14.—**Stourbridge.**—FIRE STATION, &C.—Erection of a new fire station and public conveniences, and the conversion of existing fire station into offices, "Smithfield," Stourbridge, for the T.C. Mr. Fredk. Woodward, Borough Surveyor, Market-street, Stourbridge. Deposit £2 2s.

JANUARY 14.—**Wandsworth, S.W.18.**—FOUNDATIONS.—Excavation and construction of concrete foundations for proposed extensions to the Town Hall, High-street, Wandsworth, for the Wandsworth Borough Council. Mr. E. J. Elford, M.Inst.C.E., Borough Engineer, 215, Balham High-road, S.W.17.

JANUARY 14.—**Willenhall.**—HOUSES.—Erection of 34 semi-detached parlour type houses on the Wolverhampton-road site, Portobello, for the U.D.C. Mr. G. A. Waite, Town Hall, Willenhall. Deposit £2.

JANUARY 14.—**Yoker.**—HOUSES.—Erection of 60 houses (2 blocks) at Yoker-road, Yoker, for the Renfrew C.C. Mr. Jas. A. M'Callum, District Clerk, 15, West George-street, Glasgow. Deposit £1 1s.

JANUARY 15.—**Aldershot.**—SHOP.—Demolition of existing building and erecting new shop in Union-street, for Mr. H. Uglow. Messrs. Friend & Lloyd, architects, Aldershot.

JANUARY 15.—**East Ardsley.**—PARTITION.—Erection of a folding partition at East Ardsley Council School. Education Department, County Hall, Wakefield.

JANUARY 15.—**Gateshead.**—TELEPHONE EXCHANGE.—Erection of a telephone exchange at Gateshead, for the Commissioners of His Majesty's Office of Works. Contracts Branch, H.M.O.W., King Charles-street, London, S.W.1. Deposit £1 1s. (payable to the Secretary).

JANUARY 15.—**Isle of Wight.**—HOUSES.—(1) Erection on Trafalgar Estate, Newport, I.W., of (*a*) one or more pairs of 12 pairs of semi-detached houses, "C" design; (*b*) one or more pairs of 12 pairs of smaller semi-detached houses, "D" design; or (*c*) one or more blocks of eight houses of three blocks of eight houses, "E" design. (2) For the construction and laying of drains: (*a*) to 12 pairs of semi-detached houses, or (*b*) to three blocks of eight houses, for the Council of the Borough of Newport. Borough Surveyor, Municipal Offices, 38, Quay-street, Newport, I.W.

JANUARY 15.—**Newport, Mon.**—TELEPHONE REPEATER STATION.—Erection of a telephone repeater station at Newport, Mon, for the Commissioners of His Majesty's Office of Works. Contracts Branch, H.M.O.W., King Charles-street, London, S.W.1. Deposit £1 1s. (payable to the Secretary).

JANUARY 15.—**Stromness.**—HOUSES.—Erection of two blocks of three-apartment houses and four blocks of four-apartment houses, for the T.C. Mr. T. S. Peace, architect, Kirkwall. Deposit £1 1s.

JANUARY 15.—**West Bromwich.**—HOUSES.—Erection of 47 houses on Tantany Estate, for T.C. Mr. A. Wickham, Town Clerk, Town Hall, West Bromwich. Deposit £2 2s.

JANUARY 16.—**Camberwell.**—FENCE.—For supply and erection of pale oak or iron fence at Casino-avenue, for the B.C. Mr. W. Bell, Borough Surveyor, Town Hall, Camberwell.

JANUARY 16.—**Edmonton.**—PAINTING.—For the carrying out of painting works on various buildings and premises, for U.D.C. Mr. C. Brown, Engineer, Town Hall, Edmonton.

JANUARY 16.—**Liverpool.**—PAINTING.—For internal painting, &c., at Smithdown-road Institution, Liverpool, for the West Derby B.G. Works Department, Belmont-road Institution, Liverpool.

JANUARY 16.—**Margate.**—PAVILION.—Alterations and additions at the Palm Bay Bathing Pavilion, for the T.C. Mr. E. A. Borg, Borough Engineer, 13, Grosvenor-place, Margate. Deposit £2 2s.

JANUARY 16.—**Newcastle-on-Tyne.**—REPAIRS.—For carrying out (1) bricklayer, drainer, concretor, carpenter and joiner, plasterer, painter and glazier; (2) plumber and electrician; (3) slater and tiler, in connection with municipal houses on the Walker Estate for one year. Housing Architect, No. 16, Cloth Market, Newcastle.

JANUARY 16.—**Norwich.**—HOUSES.—For erection of 48 houses and non-parlour cottages on Mile Cross Housing Estate, for T.C. Mr. A. E. Collin, City Engineer, Guildhall, Norwich. Deposit £1 1s.

JANUARY 17.—**Brighouse.**—HOUSES.—For erection of 12 type "B3" houses in Smith House-lane, for T.C. Mr. P. T. Grove, Town Clerk, Municipal Offices, Brighouse.

JANUARY 17.—**Edmonton.**—HUT.—Erection of a galvanised iron hut, 60 ft. by 20 ft., on concrete and brick foundations, at Nassau House Special School, for the Edmonton and Enfield Joint Managers. Mr. F. G. Apthorpe, Education Offices, Elm House, Gentleman's-row, Enfield.

JANUARY 17.—**Kingswear.**—GARAGE.—Erection of garage. Mr. W. L. Fairweather, River View, Kingswear, Devon.

JANUARY 17.—**Salford.**—HOUSES AND FLATS.—Erection of 62 houses and flats on the Weaste Housing Estate, for the T.C. Mr. G. Westcott, architect, 13, Bridge-street, Manchester.

JANUARY 18.—**Bromley, Kent.**—HOUSES.—Erection of 50 Class "A" houses, in pairs, at various sites, for Bromley Rural District Council. Council's Architect, Mr. F. Danby Smith, F.R.I.B.A., Parliament Mansions, Victoria-street, Westminster, S.W.1. Deposit £2 in Treasury Notes to the Architect.

JANUARY 18.—**Eglwyswrw, Pem.**—HOUSE.—Erection of house. Mrs. Evans, Spite, Eglwyswrw.

JANUARY 18.—**Holbeck.**—PAINTING.—For painting the exterior of the Poor Law Institution, for the B.G. Mr. George Diment, Clerk, Poor Law Offices, Holbeck, Leeds.

JANUARY 18.—**Leeds.**—WAREHOUSE.—For erection of a four-story warehouse in Park-place. Messrs. J. H. Bakes & Son, architects, Calverley Chambers, Victoria-square, Leeds.

JANUARY 19.—**Cheltenham.**—PAINTING.—For painting part of Municipal Offices, for the T.C. Borough Engineer, Cheltenham.

JANUARY 19.—**Ipswich.**—REPAIRS.—For repairs to school buildings, for T.C. Mr. E. T. Johns, surveyor, 8, Lower Brook-street, Ipswich.

JANUARY 19.—**Irchester.**—HOUSES.—Erection of six houses, for the Irchester Industrial and Provident Co-operative Society, Ltd. Mr. E. A. Taylor, Managing Secretary, Irchester.

JANUARY 19.—**Nelson.**—HOUSES.—Erection of 19 houses of the non-parlour type in blocks as follows:—8 blocks of two and one block of three at the Marsden Park Housing site, for the Housing Committee of the Borough of Nelson. Borough Surveyor, Town Hall, Nelson. Deposit £2 2s. for each trade specification.

JANUARY 19.—**Perth.**—HOUSES.—Erection of five tenements of dwelling-houses, comprising 52 two and three apartment houses, for the T.C. Mr. Thomas M'Laren, Burgh Surveyor, 16, Tay-street, Perth. Deposit £1.

JANUARY 19.—**Rotherham.**—HOUSES.—For erection of 50 houses on Eastdene Estate, for T.C. Mr. C. A. Broadhead, Housing Architect, 8t. George's Hall, Rotherham. Deposit £2 2s.

JANUARY 19.—**St. Helens.**—ALTERATIONS.—For alterations and additions to Boundary-road Baths, for the T.C. Mr. Arthur W. Bradley, Borough Engineer, Town Hall, St. Helens. Deposit £2.

JANUARY 19.—**Stocksbridge.**—HOUSES.—Erection of 20 houses on the Shay House-lane site, for the U.D.C. Mr. J. N. Singleton, surveyor, Stocksbridge. Deposit £2.

JANUARY 19.—**Warrington.**—SCREENS.—For supply of manual instruction wood screens to various schools, for T.C. Mr. J. Moore Murray, Secretary Education Office, Sankey-street, Warrington.

JANUARY 21.—**Bury St. Edmunds.**—HOUSES.—Erection of four houses in Mustow-street, for the T.C. Mr. Roland H. Beaumont, Borough Surveyor, Town Hall, Bury St. Edmunds. Deposit £2 2s.

JANUARY 21.—**Hastings.**—STEEL CONSTRUCTIONAL BUILDINGS, &C.—Steel constructional buildings, steel plate coal bunkers and chutes, reinforced concrete pond and plant foundations required for the Electrical Department by the County Borough Council of Hastings. Borough Electrical Engineer, 20, South-terrace, Hastings.

JANUARY 21.—**Reigate.**—NEW LAUNDRY AND EXTENSION OF BOILER HOUSE.—Erection of a new laundry and extension of the boiler house at the Guardians' Institution, Earlswood, for the Reigate B.G. Mr. O. J. Porter, F.S.I., 45, Bedford-row, W.C. 1. Deposit £2 2s.

✱JANUARY 21.—**Southend-on-Sea.**—HOUSES.—Erection and completion of 66 houses, comprising 26 parlour type and 40 non-parlour type, in the following blocks:—One block of 2 houses, 1 block of 3 houses, 6 blocks of 4 houses, 5 blocks of 6 houses, 1 block of 7 houses, for the Corporation of Southend-on-Sea. Mr. Robert H. Dyer, Borough Engineer, Municipal Building, Southend-on-Sea. Deposit £2.

JANUARY 22.—**Bute.**—HOUSES.—(1) Erection of house on Kerrycrusach Farm, County of Bute, 2¼ miles from Rothesay, and (2) house on Goltans Farm, 2 miles from Rothesay. Chief Surveyor, Board of Agriculture for Scotland, Edinburgh. Deposit £1 1s.

✱JANUARY 22.—**London, E.**—PAVING, &C.—For taking up and relaying certain wood-block paving and incidental work in connection therewith to a portion of roadway at the Hospital, Bancroft-road, for the Guardians of the Poor of the Hamlet of Mile End Old Town. Mr. Edmund J. Harrison, Lic.R.I.B.A., 23, Berkeley-road, Crouch End, N.8. Deposit £2.

JANUARY 22.—**Southall-Norwood.**—HOSPITAL, CUBICLE BLOCK, STABLES, COTTAGES.—(*a*) The erection of an eight-bed cubicle block at the Sanatorium, Northroad, Southall; (*b*) the erection of a depot, stables and cottages at Adelaide Dock, Endsleigh-road, Southall, for the Southall-Norwood Urban District Council. Mr. J. B. Thomson, Assoc. M.Inst.C.E., &c., Engineer and Surveyor to the Council, Town Hall, Southall, at my office, between 10 and 4 p.m. (Saturdays 10 and noon).

JANUARY 23.—**East Ellce.**—COTTAGES.—For the erection of 5 pairs of cottages in Whaplode Village, 4 pairs in Gedney Fen (Bells Bridge), and 2 pairs in Sutton St. James (Birds Drove), for the R.D.C. Mr. S. S. Mossop, Jun., Clerk, West End, Holbeach.

JANUARY 23.—**Hackney.**—PAINTING.—For painting exterior public baths, Lower Clapton-road, for the B.C. Mr. Norman Scorgie, Borough Engineer, Town Hall, Hackney, E. 8. Deposit £1 1s.

JANUARY 23.—**Worthing.**—PAVILION.—Erection of a sports pavilion at Beach House Park, Worthing, for the Borough Council. Borough Surveyor, Municipal Offices, Worthing. Deposit £1 1s.

JANUARY 24.—**Camberwell.**—FLOORS.—For taking up and relaying sectional wood flooring, including platforms, barriers, joists, cradles, sills, &c., over the Swimming Baths at the various Public Baths of the B.C. Mr. William Bell, Borough Engineer, Town Hall, Camberwell, S.E.5.

JANUARY 24.—**Liverpool.**—TENEMENT DWELLINGS.—Erection of six tenement dwellings on the St. Augustine-street frontage of the Blenheim-street site, for the Housing Committee of the City of Liverpool. Director of Housing, Municipal Buildings, Dale-street, Liverpool. Deposit £2 2s.

✱JANUARY 24.—**London, S.W.2.**—REPAIRS AND DECORATIONS.—Repairs and decorations to the Librarian's residence at the Tate (South Lambeth) Library, South Lambeth-road, S.W. 8, for the Metropolitan Borough Council of Lambeth. Mr. Osmond Cattlin, Borough Engineer, Town Hall, Brixton-hill, S.W. 2.

JANUARY 24.—**Ystradgynlais.**—HOUSE.—For erection of dwelling-house at Ystradgynlais (Glam). Mr. T. W. Thomas, 4, Canolrhiw Villas, Brecon-road, Ystradgynlais.

JANUARY 25.—**Richmond, Surrey.**—COTTAGES.—Erection of eight cottages in Darell-road and two in Dancer-road, for the B.C. Borough Surveyor, Town Hall, Richmond, Surrey. Deposit 10s. 6d.

JANUARY 26.—**Barnstaple.**—HOUSES.—For the erection of 13 houses on the Newport Housing Site, for the T.C. Borough Surveyor, The Strand, Barnstaple. Deposit £3 3s.

JANUARY 26.—**Exminster.**—OPERATING THEATRE.—Erection of an operating theatre at the Devon Mental Hospital. Messrs. E. H. Harbottle & Sons, architects, County Chambers, Exeter. Deposit £3.

JANUARY 26.—**Ilfracombe.**—ALTERATIONS.—For new cells and alterations and additions to Ilfracombe Police Station, for the Devon C.C. Messrs. E. H. Harbottle & Sons, architects, County Chambers, Exeter. Deposit £3.

✱JANUARY 26.—**Marylebone, W.1.**—SUNDRY REPAIRS, PAINTING, CLEANSING, &C.—Execution of sundry repairs, painting, cleansing and other work at the St. Marylebone Home, 1, Northumberland-street, W.1, for the Board of Guardians of St. Marylebone. Messrs. Constantine & Vernon, architects, 82, Mortimer-street, W.1, between the hours of 10 a.m. and 5 p.m. on January 7, 8, 9, 10, and 11. Deposit £1 (Treasury Note) to architects.

✱JANUARY 28.—**Guildford.**—HOUSES.—Erection of alternative types of non-parlour houses as follows:—twelve houses on the West Horsley site, six houses on the Peaslake site, in the parish of Shere, six houses on the Pathfield site, in the parish of Shere, for the Guildford Rural District Council. Mr. John Anstee, Council Offices, Commercial-road, Guildford. Deposit £2 2s.

JANUARY 28.—**London, S.E.1.**—HOUSES AND ROADS.—Development of a portion of the new Downham housing estate at Grove Park, Lewisham, S.E.: (1) Construction of roads, sewers and other works; (2) the erection of houses and such other buildings as may be determined. Tenders are invited on two alternative bases—(*a*) on the basis of the Council bearing the actual cost of and financing the undertaking and paying a fee or commission to the contractor for his services, the amount of such fee or commission being dependent partly upon a comparison or cost with a pre-determined value for the London County Council. Administrator of Housing Development Schemes, Old County Hall, Spring-gardens, S.W.1, upon payment of £10.

JANUARY 28.—**Whittingham.**—COTTAGES, &C.—For erection of 15 pairs of parlour cottages near Mental Hospital, and construction of 450 yds. of roads, &c., for Committee of Visitors for County Mental Hospital. Mr. E. J. Andrew, 33, Winckley-square, Preston. Deposit £1 1s.

✱JANUARY 28.—**Tendring.**—COTTAGES.—Erection of 28 cottages in the parishes of Ardleigh, Lawford and Tendring, for the Tendring R.D.C. Mr. F. G. Vincent-Brown, Cliff-road, Dovercourt Bay. Deposit 10s.

JANUARY 29.— **Consett.**— HOUSES. — Erection of cottages houses, to be in blocks of two, four, six and eight. Tenders for 50, 100 and 150 of such, for the U.D.C. Mr. Frank A. Coyle, Architect, 29, Newmarket-street, Consett. Deposit £2 2s.

JANUARY 29.—**Ebbw Vale (Mon).**—NEW STATION BUILDINGS.—For erecting, for the G.W.R Co. at Ebbw Vale (Mon), of new station buildings. Office of the Engineer, Newport (Mon), G.W.R. Station.

✱JANUARY 29.—**Enfield.**—TELEPHONE EXCHANGE.—Erection of a telephone exchange at Enfield, for the Commissioners of His Majesty's Offices of Works. Contracts Branch, H.M.O.W., King Charles-street, London, S.W.1. Deposit £1 1s. (cheques payable to the Secretary).

✱JANUARY 30.—**Brentwood, Essex.**—BALCONY AND VERANDAH.—Erection of a balcony and verandah to an existing building at High Wood Hospital for Children, Ongar-road, Brentwood, Essex, for the Metropolitan Asylums Board. Office of the Board, Victoria Embankment, E.C.4. Deposit £1.

✱JANUARY 30.—**London, N. 21.**—WOOD BLOCK FLOORING.—Screeding and relaying a floor with new wood blocks at the Northern Fever Hospital, Winchmore Hill, N. 21, for the Metropolitan Asylums Board. Office of the Board, Victoria-embankment, E.C. 4. Deposit £1.

✱JANUARY 30.—**London, N.W. 5.**—CLEANING AND PAINTING.—Cleaning and painting at St. Margaret's Hospital, Leighton-road, Kentish Town, N.W. 5, for the Metropolitan Asylums Board. Office of the Board, Victoria-embankment, E.C. 4. Deposit £1.

JANUARY 31.—**Hemel Hempstead.**—COTTAGES.—Erection of 24 cottages (in sections of 12), for the Borough of Hemel Hempstead. Mr. Walter R. Locke, Borough Engineer and Surveyor, Market-square, Hemel Hempstead. Deposit £1.

JANUARY 31.—**Newport, Pembroke.**—PAINTING.—For the renovation of the Bethlehem Baptist Chapel. Mr. J. Harris, "Penfeeder," Newport, Pem.

FEBRUARY 1.—**Burlingham.**—REPAIRS, &C.—For adapting and repairing the farm buildings at Perowne's Farm, Jary's Estate, Newport Farm and Lodge Farm, Burlingham Estate, for the Norfolk C.C. Small Holdings Committee. Mr. Victor Playle, County Land Agent, Shirehouse, Norwich. Deposit £1 1s.

✱FEBRUARY 1.—**Swansea.**—SCHOOL.—Erection of a new elementary school for 1,308 scholars on the Town-hill Estate, Swansea, for the Education Committee of the County Borough of Swansea. Mr. Ernest E. Morgan, Borough Architect, 3, Prospect-place, Swansea. Deposit £5 5s.

FEBRUARY 2.—**London, S.E. 18.**—EXTENSION.—Proposed extension of premises, for the Committee of the Woolwich Catholic Club. The Secretary, Woolwich Catholic Club, 28–30, New-road, Woolwich, S.E. 18.

FEBRUARY 9.—**Ashford.**—SHEDDING, &C.—For erecting shedding, offices, stands, and other works for the Agricultural Show to be held at Ashford on July 10, 11 and 12, for the Kent County Agricultural Society. Major R. J. Bacon, secretary, Otham, Maidstone.

✱FEBRUARY 26.—**London, E.3.**—BUILDING ADDITIONS, &c.—Building of a nurses' dining-room, alterations and additions, and redecorations at St. Andrew's Hospital, Devon's-road, Bow, E.3, for the Managers of the Poplar and Stepney Sick Asylum District, St. Andrew's Hospital. Messrs. Andrews & Peascod, architects, 135, Bow-road, E.3. Deposit £3.

NO DATE.—**Hull.**—DEMOLITION.—Hull Corporation invite tenders for the demolition of the St. John's Church, Victoria-square, Hull. Applications to Mr. H. A. Learoyd, Town Clerk.

NO DATE.—**Lindley.**—HOUSES.—For erection of two houses at Lindley. Mr. J. Ainley, architect, 3, Chapel-hill, Huddersfield.

NO DATE.—**Lockwood.**—HOUSE.—Erection of detached house in Woodside-road. Mr. J. Ainley, architect, 3, Chapel-hill, Huddersfield.

NO DATE.—**St. David's (Pembroke).**—PLASTERING.—For the whole of internal and external plastering in connection with the new vicarage at Puncheston. Mr. Edwin G. Thomas, builder, St. David's.

✱NO DATE.—Erection of several bungalows (small type). Only builders need reply who can refer to recent satisfactory work. Box 286, Office of *The Builder*.

FURNITURE, MATERIALS, etc.

JANUARY 12.—**Driffield.**—MATERIALS.—Supply of road materials to the R.D.C. Mr. T. C. Beaumont, surveyor, Driffield.

JANUARY 12.—**Stockton-on-Tees.**—STORES.—Supply of stores to the Stockton-on-Tees and Thornaby Joint Corporation Tramways. Manager, Bridge-road, Stockton-on-Tees.

JANUARY 14.—**Huddersfield.**—TIMBER.—Supply of creosoted open pale fencing to the T.C. Borough Engineer, 1, Peel-street, Huddersfield.

JANUARY 14.—**Silsden.**—RETORTS, &C.—Supply of retorts, fireclay goods and silica goods to the U.D.C. Mr. M. Driver, Gas Works, Silsden.

JANUARY 14.— **South Stoneham.**—MATERIALS.—Supply of broken stone to the R.D.C. Mr. W. R. Cowell, Surveyor, Council Offices, West End, Hants.

JANUARY 16.—**Cardiff.**—FURNITURE.—For furniture for new Infants' Hospital block at Cardiff Workhouse, for the Board of Guardians. Mr. R. Stephenson, Clerk, Union Offices, 11, Park-place, Cardiff.

JANUARY 16.—**Dorchester.**—MATERIALS.—Supply of tar macadam, limestone, granite, tar, &c., to the Dorset C.C. Mr. W. T. Fletcher, County Surveyor, Dorchester.

JANUARY 19.—**Manchester.**—GRANITE SETS.—Supply of granite sets to the T.C. Paving, &c., Department, Town Hall, Manchester.

JANUARY 21.—**Chichester.**—MATERIALS.—Supply of tar and road materials to the T.C. Mr. F. J. Lobley, City Engineer, Chichester.

JANUARY 21.—**Darlaston.**—FILTERING MEDIUM.—Supply of 6,400 cu. yds. of cold blast slag or granite filtering medium, delivered on the Sewage Works, for the U.D.C. Messrs. Dodd, Dodd & Watson, County Chambers, Corporation-street, Birmingham. Deposit £1.

✱JANUARY 21.—**Egypt.**—STORES.—Supply of stores for one year to the Ports and Lights Administration. Dept. of Overseas Trade, 35, Old Queen-street, S.W. Reference 12,046–F.E.–G.P.

JANUARY 21.—**Newton Abbot.**—MATERIALS.—Supply of refined tar, surface dressing, ripping and breaking stones, and gravel and sand, to the Devon C.C. Mr. Andrew Warren, County Surveyor, Avenue-road, Newton Abbot.

JANUARY 21.—**Wandsworth.**—MATERIALS.—Supply of materials and execution of works, for the B.C. Mr. D. A. Nicholl, Town Clerk, Council House, Wandsworth, S.W. 18.

JANUARY 21.— **Warrington.**— FIRE HOSE.— Supply of 10 No. 25 yds. lengths of best quality flax canvas 2½ in. dia. fire hose to the T.C. Mr. Andrew M. Ker, Borough Engineer, Warrington.

JANUARY 22.—**Lincoln.**—MATERIALS.—Supply of tarred macadam, broken stone and slag, and hire of steam rollers to the Lindsey C.C. Mr. A. G. Bradshaw, County Surveyor, Newland House, Lincoln.

JANUARY 22.—**Worthing.**—REFINED TAR.—For supply of 50,000 galls. of refined tar, for T.C. Borough Surveyor, Municipal Offices, Worthing.

✱JANUARY 23.—**Chelsea, S.W.3.**—STORES, &C.—Supply and execution of various articles and works, the contract period being from April 1 next to March 31, 1925, unless otherwise stated, for the Metropolitan Borough of Chelsea. Mr. W. R. Manning, Acting Borough Surveyor. And contracts for stationery, coal, coke, winding and timing clocks, and tailoring from the Town Clerk, Town Hall, King's-road, Chelsea, S.W.3.

JANUARY 23.—**London.**—POLISHES.—Supply to the Commissioners of H.M. Works, &c.: (1) Liquid metal polish; (2) floor polish, &c. Controller of Supplies, H.M. Office of Works, &c., King Charles-street, S.W. 1.

JANUARY 23.—**Madras.**—PIPES.—Supply of stoneware pipes and specials, ranging from 4 in. to 18 in. diameter, and aggregating a total length of 400,000 lineal ft., for the T.C. Messrs. James Mansergh & Sons, agents, 5, Victoria-street, S.W. Charge 5s.

JANUARY 24.—**Bermondsey.**—MATERIALS.—Supply of stoneware conduits, meters, wiring accessories, engine oils, &c., to the Electricity Department, Borough Electrical Engineer, Town Hall, Bermondsey, S.E.

JANUARY 24.—**Egypt.**—STORES.—Supply of stores for one year to the Dept. of Public Health. Dept. of Overseas Trade, 35, Old Queen-street, S.W. Reference 12,038–F.E.–G.P.

JANUARY 26.—**Chelmsford.**—MATERIALS.—Supply to the Highways Committee of the Essex C.C. stoneware pipes, distilled tar, broken granite, tarred slag, and lubricating oil. Mr. Wm. H. Morgan, County Surveyor, Old Court, Chelmsford.

JANUARY 26.—**Northallerton.**—MATERIALS.—Supply to the North Riding of Yorkshire C.C. of roadstone, tar and bituminous mixtures, oils and grease, &c. County Surveyor, County Hall, Northallerton.

JANUARY 28.—**Camberwell.**—MATERIALS.—Supply of road and other materials, &c. Borough Engineer, Town Hall, Camberwell.

JANUARY 28.—**Uckfield.**—MATERIALS.—Supply of road materials to the R.D.C. Mr. E. W. Ray-Johnson, surveyor, Buxted, Sussex.

JANUARY 29.—**Bermondsey.**—MATERIALS.—Supply of road and other materials for six months to the B.C. Mr. F. Ryall, Town Clerk, Town Hall, Bermondsey, S.E.

JANUARY 30.—**Ashford.**—TAR.—Supply of 20,000 gallons of No. 1 dehydrated coal gas tar, and similar preparations, for tarpainting roads, to the U.D.C. Mr. Wm. Terrill, Surveyor, 5, North-street, Ashford, Kent.

JANUARY 30.—**Islington.**—MATERIALS.—For electrical and engineers' stores, for the B.C. Borough Electrical Engineer, 60, Eden-grove, Islington, N.

FEBRUARY 1.—**Folkestone.**—MATERIALS.—For the supply of brooms and brushes, cast-iron goods, glass, iron and ironmongery, oils, paint, varnish, &c., Portland cement and timber, to the T.C. Mr. A. E. Nichols, Borough Engineer, Municipal Offices, Folkestone.

FEBRUARY 1.—**Hatfield.**—MATERIALS.—Supply of granite, slag and tar macadam, for the Herts C.C. Mr. A. E. Prescott, County Surveyor, Hatfield.

FEBRUARY 7.—**Wisbech.**—ROAD MATERIALS.—Supply of broken granite, slag and tar macadam to the Isle of Ely C.C. Mr. H. Farr Simpson, County Surveyor, Wisbech.

FEBRUARY 13.—**Middlesex.**—ROAD MATERIALS.—Supply of granite, tarred slag and granite chippings to the Middlesex C.C. Mr. A. Dryland, County Engineer, Middlesex Guildhall, Westminster, S.W.1.

FEBRUARY 20.—**Canterbury.**—MATERIALS.—Supply of road and other materials to the T.C. Mr. P. H. Warwick, City Surveyor, Canterbury.

NO DATE. — **Blyth.**—BENCHES, &C.—Supply of benches and tools for a manual instruction centre. Mr. Fred Mitchell, Director of Education, Blyth.

ENGINEERING, IRON AND STEEL.

JANUARY 14.—**Dreghorn.**—ELECTRIC LIGHTING.—Electric lighting for 10 houses at Dreghorn, for the Ayrshire C.C. Northern District Committee. Messrs. J. & J. Armour, Irvine.

JANUARY 14.—**Ebbw Vale.**—SUPPLY OF MOTOR LORRY.—For supply to U.D.C. of a motor lorry, two tons, with body suitable for sanitary scavenging work. Mr. W. A. Jones, U.D.C. Offices, Ebbw Vale.

JANUARY 14.—**Hull.**—PIPES.—Supply of 3,600 tons of 24 in., 25 in., and 36 in. cast-iron pipes and specials to the T.C. Mr. C. B. Newton, City Water Engineer, Hull.

JANUARY 14. — **Ynysybwl (Glam).** — FOOTBALL FIELD.—For making of a football field on the Recreation Ground, Ynysybwl, work to include approximately 4,000 cu. yards of excavation, in connection with the local Welfare scheme. Mr. W. G. Thomas, Surveyor, Town Hall, Mountain Ash.

JANUARY 15.—**Birmingham.**—ELECTRIC LIGHTING.—For the installation of electric lighting in the houses erected, or to be erected, on the following Corporation housing estates: York and Cateswell-roads, Hall Green, 68; Gipsy-lane and Brookvale-road, Upper Witton, 104; Mayfield-road, Tyseley, 44. Mr. E. J. Jennings, Secretary, 14, Dale End, Birmingham. Deposit £1 1s.

JANUARY 15.—**Goole.**—FENCING.—For supply of 323 lineal yards of galvanised corrugated iron fencing. Mr. J. H. Castle, Surveyor, Council Offices, Goole.

JANUARY 15.—**Toronto.**—SLUDGE PUMP.—Supply and erection at main sewage pumping station of centrifugal sludge pump, for the T.C. Dept. of Overseas Trade, 35, Old Queen-street, S.W. Reference 12614/ED/EC/2.

JANUARY 16. — **Glasgow.** — REFUSE DISPOSAL WORKS.—Tenders and designs for proposed refuse disposal works at Govan, Glasgow. Mr. W. Greig, Superintendent of Cleansing, 20, Trongate, Glasgow.

JANUARY 16.—**Keighley.**—IRONWORK.—For supply of ironwork for valve well, filter-beds, &c., for the T.C. Mr. M. Ratcliffe Barnett, Town Hall, Keighley.

JANUARY 16.—**Liverpool.**—BOILER REMOVAL.—For the removal of a steam boiler from Belmont-road Institution to the Cottage Homes, Fazakerley, and for fitting and refitting in connection therewith, for the B.G. Clerk, Union Offices, Broughton-terrace, West Derby-road, Liverpool.

JANUARY 16.—**Stoke-on-Trent.**—CRANE.—Fifty-ton electrically-driven overhead travelling crane. Borough Electrical Engineer, Stoke-on-Trent. Deposit £2.

JANUARY 17.—**New Zealand.**—PIPES, &C.—Supply of 10 in., 12 in., and 21 in. steel pipes and fittings, for the Orongorongo-Karori Water Main. Department of Overseas Trade, 35, Old Queen-street, S.W.1.

JANUARY 18.—**Great Yarmouth.**—LORRIES.—Supply to the T.C. of (a) one-ton Ford lorry, and (b) a three-ton petrol lorry, both for the collection of house refuse. Mr. S. P. Thompson, Borough Engineer, Great Yarmouth.

JANUARY 18.—**Haywards Heath.**—FILTERS.—Supply and erection of five mechanical filters, for the Mid-Sussex Joint Water Board. Mr. Francis Martin, Engineer, Waterworks Offices, Boltro-road, Haywards Heath. Deposit £3 3s.

JANUARY 18.—**Haywards Heath.**—PIPES.—Supply to the Mid-Sussex Joint Water Board of 1,750 tons of cast-iron socket pipes and specials. Mr. F. Martin, Engineer, Waterworks Offices, Boltro-road, Haywards Heath. Deposit £2 2s.

JANUARY 18.—**Haywards Heath.**—PUMPING PLANT.—Supply to the Mid-Sussex Joint Water Board of duplicate pumping plant. Mr. Francis Martin, Engineer, Waterworks Offices, Boltro-road, Haywards Heath. Deposit £3 3s.

JANUARY 19—**Aberdeen.**—TRAMWAY MATERIAL.—Supply of rails and other tramway material to the T.C. Mr. John Gordon, Burgh Surveyor, Town House, Aberdeen.

JANUARY 19.—**Depwade.**—HEATING, &C.—Supply of steel vertical boiler, horizontal semi-Diesel oil engine, dynamo and motors and accumulators, wiring for power and lighting, supply and fixing apparatus for hot-water heating and domestic hot-water supply, at the Poor Law Institution. Vulcan Boiler & General Insurance Co., Ltd., 67, King-street, Manchester. Deposit £1 1s. each for five sections.

JANUARY 19.—**Edinburgh.**—LATHE.—Supply to car repair works of a heavy pattern tramcar wheel lathe, complete with continuous current motor and equipment, for the T.C. Tramways Manager, 2, St. James'-square, Edinburgh.

JANUARY 19.—**Manchester.**—BOILER.—Supply, at the Ardwick Public Wash-house, of Lancashire boiler, 20 ft. × 8 ft., to work at 100 lb. pressure, for the T.C. City Architect, Town Hall, Manchester. Deposit 10s. 6d.

JANUARY 19.—**Manchester.**—LAUNDRY PLANT.—Supply, at the Ardwick Public Wash-house, of wash-stalls, hydro extractors, drying horses, with heater, fan, &c., for the T.C. City Architect, Town Hall, Manchester. Deposit 10s. 6d.

JANUARY 21.—**Croydon.**—COOKING APPARATUS.—Supply and installation at Mayday-road Hospital of (*a*) one double-deck drawplate steam pipe oven in brickwork, and (*b*) two separate vegetable steamers or one double steamer, for the Board of Guardians. Steward, Hospital, Mayday-road, Thornton Heath.

JANUARY 21.—**Hastings.**—VARIOUS WORKS.—Erection of steel constructional buildings, steel plate coal bunkers and chutes, reinforced concrete pond and plant foundations, for the T.C. Borough Electrical Engineer, 20, South-terrace, Hastings.

JANUARY 21.—**Pontypool.**—BOILER SEATING.—Provision of a boiler seating for a 22 ft. by 7 ft. Lancashire boiler, for the Board of Guardians. Mr. T. P. H. Watkins, Clerk, Union Offices, Pontypool. Deposit £3 3s.

JANUARY 21.—**Pontypool.**—LANCASHIRE BOILER.—For provision and installation of a Lancashire boiler, 22 ft. long by 7 ft. diameter, for 120 lb. working pressure, for the Pontypool Board of Guardians. Mr. T. P. H. Watkins, Clerk to the Guardians, Union Offices, Pontypool. Deposit £3 3s.

JANUARY 22.—**Prestwich.**—FENCING.—For supplying and fixing 265 yds. of iron unclimbable fencing, for the U.D.C. Mr. M. A. Piercy, Surveyor, Town Hall, Prestwich.

JANUARY 23.—**Lanchester.**—HEATING.—For the extension of the heating scheme at the Poor Law Institution, for the Board of Guardians. Mr. J. J. S. Barker, Clerk, Lanchester, Durham.

JANUARY 23.—**Wood Green.**—FENCING.—For supplying and fixing about 1,250 yds. of wrought-iron unclimbable fencing, with gates, &c., for the U.D.C. Mr. C. H. Croxford, Town Hall, Wood Green, N. Deposit £1 1s.

JANUARY 25.—**Newcastle-upon-Tyne.**—DERRICKS.—Supply to the Tyne Improvement Commission of three 2½ tons lattice steel derricks, fitted with electric winches. Mr. Albert Blacklock, Secretary, Bewick-street, Newcastle-upon-Tyne. Deposit £2 2s.

JANUARY 28.—**Ecuador.**—CUSTOMS HOUSE, &c.—The date for tenders for the construction of the new Custom house and wharf at Guayaquil, Ecuador, has been extended to January 28. Consulate-General, 23, College-hill, E.C.4.

JANUARY 28.—**Glasgow.**—QUAY.—For the construction of about 1,928 lineal yards of concrete quay wall forming Dock No. 1 Shieldhall, Glasgow Harbour, for the Trustees of the Clyde Navigation. Mr. T. R. Mackenzie, General Manager, 16, Robertson-street, Glasgow. Deposit £10.

JANUARY 29.—**London.**—GIRDERS.—Supply to Director-General, India Store Department, of girders. Branch 15, Belvedere-road, S.E.

FEBRUARY 4.—**Dublin.**—STEELWORK.—Supply to the Midland Great Western Railway of Ireland of steelwork for canal footbridge, Maynooth. Chief Engineer, Broadstone Terminus, Dublin. Charge 4s.

FEBRUARY 5.—**Egypt.**—PUMPING PLANT.—For supply and erection of a pumping plant to replace an existing steam plant at Qussassin. Inspecting Engineer, Egyptian and Sudan Governments, Queen Anne's Chambers, S.W.1. Charge 10s.

FEBRUARY 5.—**New Zealand.**—GIRDER SPANS.—Supply of plate girder spans to the Public Works Tender Board, New Zealand, for the Stratford Main Trunk Railway. Department of Overseas Trade, 35, Old Queen-street, S.W. Reference 12569/ED/EC.

FEBRUARY 11.—**Gainsborough.**—PUMPING PLANT.—For engine and pumping plant, for the U.D.C. Mr. S. W. Parker, Waterworks Engineer, Council Offices, Gainsborough. Deposit £2 2s.

FEBRUARY 14.—**Argentine.**—POWER STATION.—For the construction of a central electric power station of 15,000 h.p., for the Argentine State Oilfields Administration. Department of Overseas Trade, 35, Old Queen-street, S.W.

FEBRUARY 18.—**Bristol.**—ELEVATOR.—For the construction of a floating pneumatic grain elevator, to handle 150 tons per hour, at the Avonmouth Docks, for the Docks Committee. Mr. T. A. Peace, Engineer, Port of Bristol. Deposit £5.

MARCH 1.—**Jamaica.**—DAM.—For the construction of a cyclopean masonry dam and contingent works required in connection with the extension of the Kingston and St. Andrews Water Works. Crown Agents for the Colonies, 4, Millbank, London, S.W.1.

MARCH 8.—**South Africa.**—POWER STATION.—For steel frame buildings for power station and equipment of power station, &c., for electrification of railways in the neighbourhood of Cape Town, for the Union of South Africa Electricity Supply Commission. Messrs. Merz & McLellan, 32, Victoria-street, S.W. Deposit £10 10s.

MAY 1.—**China.**—BRIDGE.—The Commercial Councillor at Peking has forwarded to the Department of Overseas Trade copies of the official text of a call for tenders by the Hai Ho Conservancy Commission, for the erection of a bridge over the Hai Ho at Tientsin. Tenders must be in the hands of the Commission before noon on May 1, 1924. The cost of erecting the new bridge has been roughly estimated at Tls. 700,000, say £105,000. Department of Overseas Trade, 35, Old Queen-street, S.W.1. Reference 11647/F.E./E.C./2.

NO DATE.—**Cross Keys (Mon).**—DRIVAGE.—For driving of a drift about 650 yards long, 10 ft. by 7 ft. in the clear and at a gradient of 6 in. per yard, for the United National Collieries, Ltd. Agent, Offices of the Company, Cross Keys, Mon.

NO DATE.—**Salford.**—SIDINGS.—For the construction of railway sidings, for the Gas Committee of the T.C. Gas Engineer, Gas Offices, Bloom-street, Salford.

ROAD, SANITARY, AND WATER WORKS.

JANUARY 14.—**Cheddar.**—GAS MAIN.—Supply and laying of a 2-in. cast-iron gas pipe about ¼ mile, in Cliff-street, for the Cheddar Gas Co. Mr. R. Channon, Glendale, Cheddar.

JANUARY 14.—**Doncaster.**—ASPHALTING.—For asphalting playground at Doncaster Grammar School. Education Department, County Hall, Wakefield.

JANUARY 14.—**Hemel Hempstead.**—WATER MAIN.—Provision and laying of 550 yds. of 4 in. cast-iron water main at Markyate, for the R.D.C. Mr. T. H. Lighbody, 16, Alexandra-road, Hemel Hempstead.

JANUARY 14.—**Huddersfield.**—FENCING.—For supply of creosoted open pale fencing to Wakefield-road, for T.C. Borough Engineer, 1, Peel-street, Huddersfield.

JANUARY 14.—**Islington.**—ROADS.—For repaving with granite setts on a new foundation of reinforced concrete the carriageway of Wharfedale-road, for the B.C. Borough Engineer, Municipal Offices, Tyndale-place, N.1.

JANUARY 14.—**London, S.E.**—WATER SERVICE.—Laying of a new 2-in. water service at Castlewood, Shooter's-hill, S.E., for the London County Council. Chief Officer of the Parks Department, County Hall, Westminster Bridge, S.E.1.

JANUARY 14.—**Maldon.**—ROADS.—For the widening and extension of the Marine-parade, for the T.C. Borough Engineer, Municipal Offices, Maldon. Deposit £2 2s.

JANUARY 14.—**Mitcham.**—ROADS.—For making up Ashbourne-road, for the U.D.C. Surveyor, Broadway House, London-road, Mitcham.

JANUARY 14.—**Tipton.**—ROADS, &c.—For carrying out of sewerage, road widenings and improvements, new roads and sewers, and other work, for the U.D.C. Mr. Wm. H. Jukes, Surveyor, Public Offices, Tipton. Deposit £3 3s.

JANUARY 15.—**Bingley Harden.**—ASPHALTING.—For tar asphalting playgrounds at Council School. Education Department, County Hall, Wakefield.

JANUARY 15.—**Dover.**—ROADS.—For making up Brookfield-avenue, for the T.C. Borough Engineer, Dover.

JANUARY 15.—**Frinton.**—ROADS.—For street improvement works in Pole Barn-lane, for the U.D.C. Surveyor, Council House, Frinton-on-Sea.

JANUARY 15.—**Swinton.**—SEWER.—Construction of earthenware pipe sewer and surface water drain, and works at housing site, for the U.D.C. Mr. H. Birks, Surveyor, Council Offices, Swinton.

JANUARY 16.—**Ashburton.**—WATER MAINS.—For work of laying water mains, &c., for the U.D.C. Mr. F. A. Steer, Surveyor, 3, West-street, Ashburton, Devon. Deposit £1 1s.

JANUARY 16.—**Fulham.**—ROADS.—For making up section 1 of Daisy-lane, for the B.C. Mr. A. F. Holden, Borough Surveyor, Town Hall, Fulham.

JANUARY 16.—**Glamorgan.**—IMPROVEMENTS.—For improvement of main road, including reconstruction of bridge over Glamorganshire Canal, for C.C. Mr. W. E. R. Allen, Glamorgan County Hall, Cardiff.

JANUARY 16.—**Twickenham.**—ROADS.—For widening and making up Whitton-road, for the U.D.C. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham. Deposit £1 1s.

JANUARY 16.—**Twickenham.**—ROADS.—For making up seven roads, for the U.D.C. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham. Deposit £1 1s.

JANUARY 17.—**Nantwich.**—WATER PIPES.—For laying and jointing cast-iron water mains, &c., in Haslington, for R.D.C. Mr. H. Crabtree, engineer, 1, Dysart Buildings, Nantwich.

JANUARY 18.—**Burntisland.**—PLUMBING, &c.—For plumber and gas fitter works of five blocks of houses on the Haugh site, for T.C. Mr. J. A. Waddell, Burgh Surveyor, Burntisland.

JANUARY 19.—**Edinburgh.**—PAVING.—For laying smooth bitumastic paving along tramway track in Seafield-road, for T.C. Tramways Manager, 2, St. James'-square, Edinburgh.

JANUARY 19.—**Falmouth.**—SEWERAGE WORKS.—For laying 4,340 ft. of 21 in. concrete tubes, &c., construction of storage tank, &c., and cast-iron sea outfall, for the T.C. Mr. G. Midgley Taylor, 36, Victoria-street, S.W. Deposit £5 5s.

JANUARY 19.—**Manchester.**—SEWERS.—Construction of main drainage work, for the T.C. City Engineer, Town Hall, Manchester. Deposit £10 10s.

JANUARY 21.—**Anglesey.**—ROAD.—Reconstruction of approximately 12 miles of the main road from Amlwch to Llangefni, for the C.C. Mr. W. E. Jones, County Surveyor, Graig, Llanfair P.G., Anglesey. Deposit £3 3s.

JANUARY 21.—**Gleneagles.**—ROADS.—Construction of new roads at Gleneagles, for the London, Midland and Scottish Railway Company. Divisional Engineer, Buchanan-street Station, Glasgow. Deposit £2 2s.

JANUARY 21.—**Heywood.**—WATER MAINS.—Laying of 5 miles of 4 in. to 12 in. cast-iron water mains in Heywood, Middleton, and Chadderton, for the Water Board. Messrs. James Diggle & Son, civil engineers, 14, Brown-street, Manchester. Deposit £3 3s.

JANUARY 21.—**Southport.**—TRAMWAY TRACK, &c.—Construction of tramway routes of about 1,600 yards: also the reconstruction with concrete and bituminous asphalte of the carriageways, &c., for the T.C. Mr. A. E. Jackson, Borough Engineer, Town Hall, Southport. Deposit £3 3s.

JANUARY 21.—**Taunton.**—SEWAGE WORKS.—For reconstruction of sewage disposal works, for the T.C. Mr. I. F. Shellard, Borough Engineer, Taunton. Deposit £3 3s.

JANUARY 22.—**Coulsdon.**—ROADS.—For making up Purley Oaks-road, for the U.D.C. Mr. R. Chart, Surveyor, Council Offices, Purley. Deposit £2 2s.

JANUARY 23.—**Chipping Norton.**—WATER WORKS.—For providing and laying about 541 lineal yds. of 2 in. cast-iron water main and specials, for the T.C. Mr. R. Stanton, Borough Surveyor, Chipping Norton.

JANUARY 23.—**Truro.**—WATER SCHEMES.—Construction of cast-iron water mains, brickwork tanks, the repair of a water wheel, the supply and erection of a pump, &c., in connection with the water supply of St. Agnes, for the R.D.C. Mr. Coulter Hancock, Clerk, 12, Princes-street, Truro.

JANUARY 23.—**Wood Green.**—ROADS.—For works of private street improvements in King's-mews, for the U.D.C. Surveyor, Town Hall, Wood Green, N.22. Deposit £1 1s.

JANUARY 24.—**Ely.**—SERVICE CONNECTIONS.—For approximately 1,000 house service connections, from the main to the property line as follows: (7) excavating and refilling trenches for service pipes; (8) providing and laying lead and galvanised iron service pipes, for the R.D.C. Mr. F. W. Green, Clerk, Council Offices, 11, Lynn-road, Ely, Cambs.

JANUARY 26.—**Morley.**—ROADS.—For the surfacing of verges with red shale, planting of privets, and other incidental work on Victoria-road housing site, for the T.C. Mr. F. Turner, Borough Engineer, Town Hall, Morley.

JANUARY 26.—**Pembroke.**—ROAD MATERIALS, &c.—For supply to the Pembroke R.D.C., for a period of one year from April 1 next, of all the materials requisite for the maintenance of the highways in twenty-eight different parishes. Separate quotation of each parish. Also for supply on hire system of steam rollers and team labour, &c., and steam coal during the same period. Mr. F. S. Jones, Clerk to the Council, Main-street, Pembroke.

JANUARY 28.—**Alnwick.**—WATER MAINS.—For providing and laying 3,675 yds. of 4 in. cast-iron socket pipes along the road from Hawkhill to Alnmouth, for the R.D.C. Clerk, 24, Fonkle-street, Alnwick.

JANUARY 28.—**Amsterdam.**—PAVING.—For carrying out of about 150,000 super meters of asphaltic or other noiseless paving on foundation. Chief Engineer of Public Works, Paving Department, Town Hall, Amsterdam. Deposit £2 2s.

JANUARY 28.—**London, S.E.1.**—ROADS.—Completion of the carriageways and footways of certain roads on the Rochampton Housing Estate, Putney, in the Metropolitan Borough of Wandsworth, comprising surfacing carriageways with tarred slag macadam, paving footways with artificial stone and other work. Administrator of Housing Development Schemes, Old County Hall, Spring-gardens, S.W.1. Deposit £2.

JANUARY 29.—**Consett.**—ROADS, &c.—For 300 yards lin., and sewers, and 230 yards lin., with tarpaving and other general works, for the U.D.C. Mr. Frank A. Coyle, Architect, 29, Newmarket-street, Consett. Deposit £2 2s.

JANUARY 29.—**London.**—SEWER.—Construction of an 8 ft. internal diameter sewer in brick and iron of a total length of about 2¼ miles, Woolwich and Greenwich, for the L.C.C. Chief Engineer, Old County Hall, Spring-gardens, S.W.1. Deposit £10.

JANUARY 30.—**Hemel Hempstead.**—ROADS, &c.—Construction of a tarmacadam surfaced road about 175 yards in length, for the T.C. Mr. W. R. Locke, Borough Engineer, Hemel Hempstead. Deposit £1 1s.

FEBRUARY 2.—**Hythe.**—ROADS, &c.—Construction of roads and laying of sewers and water mains in various parts of the Borough, for the T.C. Mr. Walter F. Bickford, Borough Surveyor, 114, High-street, Hythe. Deposit £3 3s.

FEBRUARY 5.—**Cheriton.**—ROADS.—For private street improvement works in Marler-road and Kent-road, for the U.D.C. Mr. A. S. Lilley, Surveyor, Public Offices, Cheriton.

FEBRUARY 6.—**Birmingham.**—SEWAGE DISPOSAL.—For the reconstruction of the sewage disposal plant and drains at Wassell-grove Convalescent Home, near Stourbridge, for the Board of Guardians. Mr. James Curtis, Clerk, Union Offices, Edmund-street, Birmingham. Deposit £1 1s.

FEBRUARY 16.—**Greenock.**—ROADS, &c.—Construction of streets and sewers in connection with the Cowdenknowes housing scheme, for the T.C. Office of Public Works, Municipal Buildings, Greenock. Deposit £1 1s.

Competitions.

(*See Competition News, page* 40).

Auction Sales, Tenders, etc.

★JANUARY 14.—**Croydon.**—Messrs. Robt. W. Fuller, Moon & Fuller will sell, on the premises, at 12 & 13, Wandle-road, Croydon (by order of the Receiver for the debenture holders, *re* H. D. Ebbutt Ltd.), the valuable beneficial interest in the lease of the spacious workshops and premises, held for a term, having about nine years unexpired, at a low rent of £55 per annum; also the stock-in-trade and plant of a builder and decorator. Auctioneers, 83, High-street, Croydon; and High-street, Epsom.

JANUARY 15.—**London, N.W.**—Messrs. J. T. Skelding & Co. will sell, by order of Messrs. Tims, Beckett & Partners, Ltd., unreserved clearance sale of the whole of the capital at the works, 38, Harlesden-road, Willesden-lane, N.W., stock of timber, plant and machinery of van and wagon builders, shoeing and general smiths. Auctioneers, 48, Gresham-street, E.C.2.

JANUARY 15 AND 16.—**London, E.9.**—Mr. F. H. Clark will sell, at the National Projectile Factory, Hackney Marshes, E.9, absolutely without reserve, timber and material resultant of the demolition of the above factory. Auctioneer, Railway Wharf, York-road, Wandsworth, S.W.18.

★JANUARY 17.—**London, S.W.11.**—Messrs. Chas. R. Davis & Co. (late Davis & Moon) will sell, by order of the Receiver for the debenture holder, *re* Naylor's, Ltd., upon the premises, No. 24A, Randall-street, Battersea Bridge-road, S.W.11, unreserved sale of the builders', shopfitters', showcase and cabinet-makers' stock-in-trade, plant and woodworking machinery. Auctioneers, 285, Borough High-street, S.E.1.

JANUARY 17.—**North Finchley, N.**—Messrs. Wheeler & Wright will sell the remaining portions of the Westbury Estate at the Torrington Hotel. Auctioneers, adjoining Woodside Park Station, N.

JANUARY 22.—**London, W.**—Messrs. J. T. Skelding & Co. will sell, by order of Messrs. Selfridge & Co., Ltd., at the Yard, Balderton-street, Oxford-street, W., important unreserved sale of the capital surplus of builders' and contractors' plant and machinery, timber, stores and effects. Auctioneers, 48, Gresham-street, E.C.2.

JANUARY 22 AND 23.—**Banbury.**—Mr. F. H. Clark will sell, without reserve, timbers and building materials contained in the Banbury Filling Factory, Banbury, Oxon, at 11 a.m. each day. Auctioneer, Railway Wharf, York-road, Wandsworth.

★JANUARY 23.—**London, W.1.**—Messrs. Henry Butcher & Co. have received instructions to sell at the Auction Rooms, 556, Oxford-street, W.1, large quantities of miscellaneous tools and stores, &c. Auctioneers, 63 and 64, Chancery-lane, London, W.C.2.

★JANUARY 23.—**St. Aloans, Herts.**—Messrs. Harding & Son will sell, by direction of the Right Hon. the Earl of Verulam and Viscount Grimston, at the "Peahen" Hotel, St. Albans, in lots, about 112 acres of exceptionally valuable freehold building land, all on gravel soil, with over two miles of frontage to good main roads. Auctioneers, 36, St. Peter's-street, St. Albans.

JANUARY 24.—**County Down.**—Messrs. Garnet W. Holt & Co. will sell, by public auction, the Crowreach Quarries, Newry, with yard, machinery, plant, &c., on the premises at Catherine-street, Newry, to be sold in two lots. Auctioneers, Newry.

★FEBRUARY 7.—**London, W.1.**—Messrs. Knight, Frank & Rutley, in conjunction with Messrs. Oakden & Co., will sell, at the Hanover-square Estate Room (unless previously disposed of), by direction of the Eastbourne Waterworks Company, freehold commercial site of about 4¼ acres, with railway facilities, and including detached double-fronted residence, factory and warehouse buildings. Auctioneers, 20, Hanover-square, London, W.1.

Public Appointments.

JANUARY 14.—**Burnley.**—(*a*) An Assistant experienced in Architectural Work and Town Planning; (*b*) a general Assistant, experienced in the design and construction of Reinforced Concrete and Steel Frame Structures, and Estimating, required by the County Borough Council of Burnley. Borough Engineer and Surveyor, Town Hall, Burnley, endorsed "Assistant."

★JANUARY 19.—**Southend-on-Sea.**—Clerk of Works required by the County Borough of Southend-on-Sea, age not to exceed 45 years; applicants must be experienced. Mr. Robert H. Dyer, Borough Engineer, Municipal Buildings, Clarence-road, Southend-on-Sea.

★JANUARY 21.—**Southend-on-Sea.**—Building Inspector required in the Borough Engineer and Surveyor's Department, by the County Borough of Southend-on-Sea; candidates must be experienced in similar work. Mr. Robert H. Dyer, Borough Engineer, Municipal Buildings, Clarence-road, Southend-on-Sea.

★FEBRUARY 1.—**Swansea.**—Architectural Draughtsman required in the Borough Architect's Department by the County Borough of Swansea. Borough Architect, Guildhall, Swansea, endorsed "Draughtsman."

PROPOSED NEW BUILDINGS & OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced. Abbreviations :—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C for Rural District Council: E.C. for Education Committee; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

AMMANFORD.—The M.H. has asked for plans and estimates of the U.D.C. scheme for sewerage scheme. The Council has decided to at once proceed with acquisition of land for cemetery and has requested Ministry sanction to undertake fencing of ground.

BATLEY.—Plans passed by T.C.: Additions to house, Wellington-street, for Mrs. Box.

BELFAST.—A sum of £80,000 is to be spent on providing new schools during the year.

BELFORD.—Plans passed by R.D.C.: Pair of houses, Seahouses, for Messrs. E. Fordy & Sons.

BLACKBURN.—Plans passed by T.C.: Lock-up shop, Stopes Brow, by Mr. W. T. Shaw; house, Pleckgate, by Mr. John Whalley; ice-cream factory, St. Clement-street, by The Blackburn Crystal Ice Co.

BRADFORD.—The T.C. has granted the following applications to proceed with the development of lands: Bradford Council of Social Service, Allerton-road, 104 houses; A. Chippendale & Co., Smith-lane, &c.; A. Robinson, Highfield-avenue, Highfield-road, Idle, 18 houses; W. A. Newell, Wrose-road, Idle, 12 houses; W. A. Wilman Bros., Pendragon-lane, four houses; C. A. Gadie, Wharncliffe-drive, two pairs of houses; J. H. Pitchers & Sons, Moor Park-drive, semi-detached houses; L. Holland, Parkside-road, bungalow; R. J. Patchett, Ltd., Harbour-road and Buttershaw-lane; Mr. A. Wilson, Thornton-road; Messrs. Foster Bros., Whitby-road; Mr. A. Priestley, Highfield-road, Idle; Mr. J. Briggs, Lower Wyke-lane; Messrs. Dickinson & Scott, Wellington-road, Eccleshill, six houses.

BRAINTREE.—The R.D.C. has passed plans for 20 houses at Bocking, for Messrs. Courtauld.

BRIDLINGTON.—The T.C. has received notification that the M.H. has conditionally approved the scheme for the erection of a sea wall on the south side at an estimated cost of £107,000, the first section to cost £54,000, and that an Unemployment Grant will be made towards the cost.

BURNLEY.—Plans passed by T.C.: Two bungalows, Underly-street, by Messrs. Lancaster, Son & Parkinson; conversion of four houses, Accrington-road, into shops, by Mr. W. Rusius; lock-up shop, Extwistle-street, by the Burnley Building Society, Ltd.

BURTON-ON-TRENT.—It has been decided to erect a new building in place of the Mission Room, to accommodate 350 persons, at an estimated cost of £900.

BUXTON.—Plans passed by T.C.: Miss M. Thompson, house in Temple-road; Mr. A. Oldfield, house in Park-road; Buxton Cottage Hospital Committee, mortuary at Cottage Hospital; Mr. James Kirkland, bungalow in London-road; Messrs. J. & F. Brindley, house in Macclesfield-road.

CHICHESTER.—Plans passed by T.C.: Villa, off Stodsbridge-road, for Mr. W. P. Breach; two villas, Market-avenue, for Mr. Springings.

COLCHESTER.—Plans passed by T.C.: House, Straight-road, Lexden, for Mr. H. N. Major; house, King Harold-road, Shrub End, Mr. P. Stow; pair of houses, Bergholt-road, Mr. A. J. Diss; houses in Drury-road, for Mr. A. E. Warner, Mr. P. D. Smith, Mr. H. Westley, Mr. S. F. Dodson, and Mr. A. B. Gusterson; four almshouses, Winsley's-square, the Trustees; rebuilding of premises, High-street, Messrs. W. Paull & Co.; house, Victoria-road, Mr. A. Florey; new bank premises, High-street, Nat. Prov. Union; house, Straight-road, Shrub End, Miss E. Digby; bungalow, Shrub End, Mr. S. G. Purkiss; house, Straight-road, Shrub End, Mr. A. C. Pryke; five bungalows, Greenstead-road, Mr. A. Crowther; six houses, Old Heath-road, Messrs. Grimsey Brothers; houses, Ipswich-road, Mr. W. N. Best and Mr. C. H. Smy; pair houses, Greenstead-road, Mr. P. M. Sloman; house, Nelson-road, Mr. G. Ireland.

CROYDON.—A cottage is to be erected by the T.C. at Russell Hill Reservoir at an estimated cost of £650.—A laboratory is to be erected at the Croydon Mental Hospital at a cost of £500.—Sanction has been received from the Ministry of Health to borrow £20,000 for the enlargement of the Norbury outfall sewer.

DEVIZES.—Plans have been adopted by the T.C. for pairs of cottages on the Southbroom site, for Messrs. L. Maslen & Sons, Mr. T. Stevens, and Messrs. W. E. Chivers & Sons, Ltd.

DEWSBURY.—Plans passed: House on Wakefield-road site, for Mr. J. W. Clegg; house, Wakefield-road site, for Mr. A. Milner; house, Wakefield-road site, for Mr. J. E. Wilson; two houses at Longcauseway, Thornhill, for Messrs. H. D. & G. Benson; house, Longcauseway, Thornhill, for Mr. H. Pease; four houses, Commonside-road, for Mr. J. Crossley; house, Wakefield-road site, for Mrs. Atkinson; house, Wakefield-road site, for Mr. Kemp; house, Wakefield-road site, for Mr. Ledgard; 10 houses at Ouzelwell-lane, for Messrs. Ingham's Thornhill Collieries, Ltd.; three houses off Slaithwaite-road, for Messrs. Brooke Bros.; three houses at Wakefield-road site, for Mrs. Wainwright and Messrs. J. W. Hampshire & Tillotson. The M.H. has approved a scheme for the erection of a further 20 houses on the Wakefield-road housing site, No. 1. Application is to be made to the M.H. for sanction to borrow £1,500 required for the conversion of Moorlands Hall into a maternity home.

DONCASTER.—The Watch Special Sub-Committee has recently inspected the site of the Tannery, Church-street and Grey Friars'-road, which they considered suitable as a site for a fire station and firemen's dwellings, and recommended that the Chief Constable and the Estates Surveyor be instructed to submit schemes for the erection thereon of a fire station and firemen's dwellings, for consideration by the Watch Committee.—The T.C. have also approved of schemes for the erection of 50 houses at Warmsworth-road site, at an estimated cost of £18,082, and for 19 houses in Olive-road, estimated cost £6,942.

DROXFORD.—Plans passed by R.D.C.: Two houses at Meonstoke, for Mr. J. O. Chrystal.

DUDLEY.—Plans passed by T.C.: Christadelphian Trustees, Meeting-room and house, Stourbridge-road; Mr. George Jewess, bungalow, Pedmore-road, Woodside; Mr. Davis, house, Park-road; Mr. M. Hipkiss, house, Arch Hill-street, Netherton; Mr. M. Hipkiss, two lock-up shops, High-street, Netherton; Mr. G. Loat, house, Stourbridge-road.

EDINBURGH.—At the Dean of Guild Court, 25 cases were considered—19 full petitions were granted, the chief of which were the following: Bungalow, for Mr. James Lackie, Allermuir-road, Colinton; 2 houses, for Mr. J. A. Morton, Riselaw, Corstorphine; house, for Mr. Geo. A. Peat, Midmar-drive; 2 bungalows, for Mr. Wm. Robb, Drum Brae; war memorial, Castle, for the Scottish War Memorial Committee; bungalow, for Mr. T. Stoddart, Craiglockhart-drive; bungalow, for Mr. R. E. Taylor, Fernielaw-avenue, Colinton; 4 flatted houses, for Messrs. Topping & Co., Mayfield; double cottage, for Mr. John Westwood, Robbs-lane, Gorgie; sub-division of self-contained house into 3 houses, for Mr. John White, 15, Buckingham-terrace; house, for Mr. G. Williamson, Dovecot-road, Corstorphine; public wash-house, Abbeymount, for the Edinburgh Corporation.——A warrant was also granted for a new building in Duncan-street, Newington, to be used as a telephone exchange, at an estimated cost of £6,000. It is proposed to erect two other telephone exchanges—one at Murrayfield, and the other at Morningside; the present office in Rose-street is to be reconstructed and adapted to other uses. The estimated cost of these three exchanges is £20,000, exclusive of plant and installation.——The alteration and improvement of the Braid Hills Hotel has been considered by the magistrates. Plans have been passed whereby the hotel will be brought up to date, and a number of modern improvements will be introduced.——It has been decided to carry out extensions to the Royal Blind Asylum and School by erecting a pavilion with an area of 5,000 super feet on the ground. The extension is to be on the west side of main buildings, and tenders are to be invited for the work.—The T.C. have procured a site, 50 acres in extent, at Lochend, for the purposes of a town-planning scheme.

EXMINSTER.—It has been decided to construct a new loop-line on the down side of the G.W.R. at Exminster, where extended refuge sidings are included in a scheme of additional accommodation.

FALKIRK.—The Dean of Guild Court has sanctioned plans for steel-frame workshops and warehouse extensions by Messrs. R. & A. Main & Co., Gothic Iron Works, Camelon, and the application of the Camelon Iron Co. for warrant to extend their Berlin blacking shop at a cost of £400.

FERRYBRIDGE.—The Yorkshire Electric Power Co. is embarking upon a scheme for the erection of a large generating station at Ferrybridge, which is ultimately expected to cost £2,000,000; about 130 acres is available for the purposes of the station and provision will be made for a dock to cope with the largest size of canal barges, also for new railway sidings. Tenders will shortly be let for the supply of generating plant.

FOLESHILL.—Plans passed by R.D.C.: 28 houses, for Mr. G. H. Pickering in Hob-lane, Heath and Newtown-roads, Bedworth; two houses for Mr. Gilkes in Heath-road, Bedworth; two houses for Mr. A. Jones in Wheelwright-lane, Foleshill.

FOLKESTONE.—Plans passed by T.C.: House and shop, Canterbury-road, Mr. A. R. Bowles, architect for Messrs. Hayward & Paramor; two houses and shops, Cheriton-road, for Mr. E. Gibbons.

GLAMORGANSHIRE.—The Pontardawe Council has passed plans for 14 houses at Denea-road and 16 houses at Alltycham, for Messrs. Gilbertson (steel works).——The Treharris workmen are formulating scheme for erection of institute and cottage hospital; Mr. T. Andrews, J.P., is secretary.——The County Council is arranging with local authorities, several of whom have promised support, for erection of home for mental deficients.——Application has been made by the Tondu district for erection of public hall (estimated to cost £10,000); Mr. Mason, Cardiff, of the Welsh section of the Industrial Welfare Association, has the application in hand.——The C.C. is embarking upon a scheme for the erection of a large number of schools, together with several mining and engineering laboratories (as part of a scheme of mining education under the Mining Industry Act), and a metallurgical laboratory. The cost of the erection of these new schools and the sites is estimated to total £500,000, and it is proposed to carry out the work during 1924 and 1925. New secondary schools are to be built at Bargoed (£15,500), Gorseinon or Grovesend (£16,500), Pontyclun (£16,500), Pyle (£16,500), and at Whitchurch. The new intermediate school at Caerphilly will cost £30,000, the new girls' department at the Neath Intermediate School £20,000, and the new girls' intermediate school at Port Talbot £20,000. The adaptation of Duffryn House, the one-time residence of Lord Aberdare, as an intermediate school for Mountain Ash, will cost £6,000. Additions and extensions are also contemplated at Aberdare Girls' Intermediate School, the present Bargoed Secondary School, Barry Boys' Intermediate, Cowbridge Grammar School, Garw Secondary, Gelligaer Intermediate, Gowerton Intermediate, and the Ogmore and Pontardawe Secondary Schools. The following new elementary schools are to be erected:—Bridgend, new school for 300, £8,000; Bryncethin, mixed and infants' department for 350, £11,000; Cadoxton, senior and junior departments for 600, £13,000; Cymmer, boys' department for 320, £8,500; Cymmer special subjects centre, £2,500; Derwen Deg, additions for 100, £2,500; Dinas Isaf, senior and junior departments for 800, £19,000; Dunvant new mixed and infants' department for 300, £7,500; Gorseinon, new infants' department for 400 and addition of 80 to boys' department, £10,000; Gwyndy, girls' department for 400, £9,000; Hendre, girls' department for 300, £7,500; Laleston, mixed and infants' department for 150, £4,500; Llanharan, infants' department for 200, £4,050; Llantrisant, additions for 100, £2,000; Llantwit Fardre, boys' or girls' department for 350, £7,700; Maesmarchog, infants' department for 150, £3,450; Nantymoel, boys' department for 416, £12,500; Nantymoel, conversion of existing boys' and girls' departments into girls' department for 348, £4,290; Nantymoel, remodelling infants' department, £2,317; Pantynawel, mixed and infants' school for 400, £9,200; Pencoed, additions for 180, £3,600; Pontlliw, mixed and infants' school for 150, £3,500; Pontyclun, mixed and infants' department for 450, £8,900; Pontycymmer, boys' department for 500, £12,000; Pwllcarn, mixed and infants' school for 200, £5,000; Pyle, mixed and infants' school for 300 and special subjects centre, £9,500; Rhiwbina, mixed and infants' school for 350, £8,000; Skewen, handicraft rooms for boys, £1,250; Tiryberth, boys' and girls' departments for 800, £19,000; Tonmawr, additions for 150, £3,000; Tymeinwr, senior mixed department for 400, £11,000; Ystrad Mynach, boys' department for 400, £11,000.

GELLYGAER.—The U.D.C. has approved plans for erection of 100 houses at Penallta for the Housing Corporation of Great Britain, Ltd. The Surveyor has submitted estimates as follows, for lay-out of Bargoid Park by the Council:—Fencing, gates, &c., £1,664; drainage £120; house and shed adjoining, £360.

HAGGONFIELDS.—The Nottinghamshire E.C. proposes building a school at once, in view of the housing scheme of the Shireoaks Colliery Co. at Phodesie.

HALSTEAD.—The R.D.C. has passed plans for a pair of houses at Parley Beams, for Miss K. M. Courtauld.

HEBDEN BRIDGE.—The local Trades and Labour Club Council are to erect a new Trades and Labour Club at Holme-street. The estimated cost is £5,000, of which £3,500 has already been raised. Plans have been prepared by Mr. J. T. Cockroft.

HOVE.—Plans passed by the T.C.: Mr. E. Harrison, for Mr. C. T. Watts, bungalow, Portland Villas; Mr. E. E. Brown, house and motor garage, Langdale-road; Messrs. Field & Cox, for Messrs. Carter Paterson, canteen, Cambridge-grove; Mr. W. H. Overton, for Mr. Marchant, three pairs semi-detached houses and 16 motor garages, Wilbury-avenue; Mr. F. Goodchild, for Mr. W. Querro, detached house and garage, Hallyburton-road; Mr. F. G. Sainsbury, for Mons. G. Flessinger, house, Princes-crescent; Messrs. C. J. Kerridge & Son, Ltd., for Mr. H. Pears, workshops, Old Shoreham-road; Messrs. Young & Mackintosh, for Mr. F. E. Greville, pair semi-detached houses, Kingsway, at Saxon-road; Messrs. Young & Mackintosh, for Mr. F. E. Greville, three detached houses, Kingsway, at Tandridge-road.

ILFORD.—The Essex E.C. has approved the plans of the County Architect for a secondary school at an estimated cost of £45,041, and authorised the preparation of plans for a caretaker's cottage at a cost of £750.

ILKESTON.—Plans passed by T.C.: Pair of houses, Cantelupe-road, for Stenson & Chapman; pair of houses, Nottingham-road, for W. Holbrook; stable, Albert-street, for J. Loseby; two pairs of houses, Hallam Fields-road, for E. Cobb.

KEIGHLEY.—The T.C. have approved a recommendation from the Housing Committee for the acceptance of tenders for the erection of 30 houses on the Broomhill Estate at an estimated cost of £15,000.

KEXBROUGH.—The West Riding C.C. E.C. propose to erect a new elementary school to accommodate 300 children.

LEEDS.—The Finance and Parliamentary Committee of the Corporation has approved the proposals for alterations to premises in Park-lane. These offices are to be utilised by the City Treasurer's Department. It was decided to apply for borrowing powers to carry out the necessary alteration of premises, furnishing and equipment, at an estimated cost of £18,826.

LEYTON.—Plans passed by U.D.C.: T. Cox, garage and offices, 442, High-road, Leyton; J. A. Dartnall, new premises with billiard hall, 638, High-road, Leytonstone.

LIVERPOOL.—The T.C. has prepared an electricity extension scheme to cost £640,000.

LLANYBYTHER.—The M.T. has promised R.D.C. 50 per cent. of cost of reconstructing Nantyffin Bridge and has asked that plans of work be submitted.

MALTON.—The scheme for a new hospital has advanced a step by the generous gift of an excellent site in Middlecave-road by Earl Fitzwilliam. Plans have been prepared, estimated cost is £17,000, of which £6,500 has been raised. The various parishes are to subscribe the remainder.

MANCHESTER.—Plans passed by T.C.: Sixteen houses, Clevendon-street and Whiteway-street, Moston; eight houses, Whiteway-street and Vernon-street, Moston; eight houses, Clevendon-street and Vernon-street, Moston; two houses, Hill-lane, Blackley; 16 houses, Hill-lane, Blackley; 32 houses, Beresford-road and Elsdon-road, Rusholme; 34 houses and two shops and houses, Beaver-road, Adria-road, Veronica-road, and Gaddum-road, Didsbury; ten houses, Omer-drive, Burnage; addition to museum, Manchester University, Oxford-road, Chorlton-upon-Medlock; six houses, Alexandra Park; four houses, Waltham-road and Springbridge-road, Withington; four houses, Manley-road, Withington.

MERTHYR TYDFIL.—Plans passed by B.C. Plans Committee: Lock-up shop in Aberdare-street, for Mr. W. Morgan, Heolgerrig.——The Public Works Committee has decided to proceed with reconstruction

* See also our List of Contracts, Competitions, etc.

of west side of Taibach-road at estimated cost £2,250, and has applied for grant of necessary land.

MONMOUTHSHIRE.—The Bedwas and Machen U.D.C. has applied to the Ministry of Health for sanction to sell land at Trethomas to the Bedwas Navigation Colliery Co., who have applied for land to erect 120 houses.—The Bedwas U.D.C. has also decided to urge the Gellygaer U.D.C. to join in constructing a joint road viaduct from Hengoed to Maesycwmmer.—The Newport T.C. is to acquire St. Julian's House for conversion for secondary school purposes.—The Sites and Buildings Committee of the County Education Committee has decided to purchase land of a new school at Trauch, Pontypool. The architect has been instructed to prepare amended plans of a proposed new central school at Pontllanfraith. Notice has been given by the Bedwas and Machen U.D.C. that in March they will proceed with sewer construction and sewerage works schemes at Trethomas. It is proposed to lay 12 in. diameter mains.

MORECAMBE.—Plans passed by T.C.: Mr. W. H. Walker, 14 semi-detached houses, off South-road; Mr. T. F. Scales, house, corner of Regent-road and Windsor-road; Mr. F. Barber, house, Balmoral-road; Mr. E. A. Jowett, house, Hawarden-avenue; Morecambe Corporation, chapel, shelter, and lodge at Torrisholme Cemetery.

NEWBURY.—The T.C. has decided to erect 12 semi-detached cottages on Essex-street.

NEWPORT (ISLE OF WIGHT).—Plans passed. Mr. H. J. Dyer, architect, Southsea; ice factory, for the Isle of Wight Ice Co.

NORMANTON (YORKS).—Plans passed: Bungalow in Dalefield-lane, for Mr. J. H. Banks.

NORTHAMPTON.—Sir James Crockett has made a gift to the Northampton Hospital of £5,000 to establish an isolation building.—Plans passed by T.C.: Eight houses, Lincoln-road, for G. F. Sharman; two houses, Delapre-crescent, for E. H. Tibbs; four houses, St. George's-avenue, for A. Holloway; house, Lime-avenue, for S. Frost; house, Delapre-crescent, for J. E. Powell; house, The Crescent, for Mrs. West; house, Cedar-road, for A. E. Osborne; house, Chaucer-street, for H. Frisby; house, Garrick-road, for Supt. Thompson.

PAIGNTON.—The directors of the G.W.R. have authorised extensive improvements at Paignton station. Additional platform covering is to be provided, an enlarged booking-office and a new parcels office built, increased lavatory accommodation arranged, and a waiting shed constructed for the use of passengers. A refuge loop is also included in the plans.

PEMBROKESHIRE.—The St. Dogmael's D.C. has decided to invite tenders for repair of Moygrove Bridge, and has called for plans and estimates for proposed bridges at Pontsaithgarreg and Felinisaf, Whitchurch.

RAMSDEN CRAYS.—Plans by the County Architect of a school at an estimated cost of £5,000 have been approved by the Essex E.C.

ROTHERHAM.—Plans passed by T.C.: Mr. W. E. Taylor, jun., Moorgate-road, pair of semi-detached houses; Mr. W. Richardson, Broom-road, pair of semi-detached houses; Mr. A. J. Gill, Moorgate-road, pair of semi-detached houses; Mr. G. A. Catchpole, Boswell-street, bungalow; Mr. S. Hartley, Clough-road, house; Messrs. J. Fawcett, Ltd., 18–20, High-street, alterations to shop premises, Messrs. Williams Deacon's Bank, Ltd., High-street; Miss H. Wheatcroft, Boswell-street, pair of semi-detached houses.——Representatives of the R.D.C. and the Rother Vale and Dalton Main Collieries have met at the Ministry of Health. The colliery companies intimated that they were prepared to build a number of houses under the subsidy scheme if the Council would undertake to build an equal number. After a full discussion with the Ministry, a provisional sanction was given for the erection of 200 houses at Thurcroft—that is, 100 by the colliery company and 100 by the Rural Council; and 400 at Dalton or Thrybergh, or in that neighbourhood, of which 200 are to be erected by the colliery company and 200 by the Council.——A new police court house is to be erected, at an estimated cost of £23,000; out of this the local authority will have to contribute £10,000.

SALFORD.—Plans passed by T.C.: Construction of warehouse, Clowes-street, Salford; conversion of house into two houses, "Cona Manor," Duncan-street, Broughton; house into two houses and construction of garages, 11, Devonshire-street, Broughton.

SELBY.—At the last meeting of the R.D.C. the M.O.H. presented a report in regard to the supply of water for the extensive parish of Wistow, which had 4,312 acres and a population of 479 in 166 houses, and extended four miles from east to west and one-and-a-half miles from north to south. It was eventually decided to give notice of a proposal for two schemes to be prepared for the village and outlying parts for supplying the district with water from Selby Waterworks.

SOUTHPORT.—The T.C. agreed to the proposed expenditure of £9,000 odd on the Victoria Baths, Promenade, on condition that a plan be prepared showing the full extent of the contemplated alterations. The proposed expenditure so far is for a section of the Baths only.—The Corporation Gas Committee is applying to the M.H. for sanction to borrow £63,000 for various purposes connected with the gas estate.

SOUTHWICK.—The U.D.C. propose to proceed immediately with the erection of 90 houses, with the prospect of another 200 provided sanction is approved from the Ministry of Health to the laying out of the land.

SOWERBY BRIDGE.—Plans passed: Three houses, Milton-avenue, for Mr. F. Stockton.——The Ministry of Health has approved of the erection of 20 more houses on Albert-road Housing Site.

ST. HELENS.—Plans passed by T.C.: Four houses, Bishop-road, Mr. I. Griffiths; house, Hartington-road, Denton's Green, Mr. Henry Barton.

THORNCLIFFE.—Messrs. Newton, Chambers & Co. propose erecting general offices at Thorncliffe.

WAKEFIELD.—Plans passed by T.C.: Mr. W. H. Ogden, two houses, Bromley Mount, for Mr. G. L. Wild; Mr. A. Fisher, house, Horbury-road, for Mr. James Dyson; Mr. W. Wrigley, house, Carr-lane, for Mr. J. N. Hill; Mr. Herbert Dobson, house, Holmfield-lane, for Mr. N. Bedford; Messrs. Bell & Kay, house, off Dewsbury-road, for Mr. A. C. Milner; Messrs. Moore & Crabtree, rebuilding of wool warehouse and additions thereto, in Ings-road, for Messrs. M. P. Stonehouse, Ltd.; Mr. H. Dobson, two houses, Denby Dale-road, for Messrs. A. & H. Fisk.

WEDNESBURY.—Plans passed by T.C.: Mr. H. Waldron, house, St. Paul's-road.

WEST THURROCK.—The Thames Land Co. is seeking powers from Parliament to construct a wharf on the Essex foreshore at West Thurrock, and to carry out the scheme it is proposed to form a company with a capital of £1,500,000.

WETHERBY.—The R.D.C. has decided to commence erecting houses at once by direct labour.

WEYMOUTH.—Plans passed by T.C.: cottage, Belle Vue-road, T. G. Davidson, for Mrs. Penny.

WORTHING.—Plans passed by T.C.: House and shop, Broadwater-road, T. R. Hyde, for Potter, Bailey & Co., Ltd.; three houses, shop and showroom and 36 lock-up garages on the south side of Railway-approach, F. G. Abell, for Worthing Estates Building Co.; house, Langton-road, F. G. Abell, for Worthing Estates Building Co.; two houses, Gannon-road, J. E. Lund, for F. H. Butler; house, Lansdowne-road, E. G. Goodall, for N. L. Watts; 14 houses, Church-walk and Navarino-road, for E. H. Barton; house, Pavilion-road, J. Gausden, for G. W. Wyatt; two blocks of three flats and garage fronting Wordsworth-road and Heene-place, W. B. Collins, for T. R. Dewell; two houses, Gannon-road, for E. H. Barton; three houses and garages, Homefield-road, for G. Tickner; vicarage Victoria-road, T. R. Hyde, for Vicar and Churchwardens of St. Andrew's Church; house, Bath-road, A. Carden, for W. Boswell; house, Littlehampton-road, H. J. Sparkes, for W. Margesson; house, Ham-road, E. W. Sparkes, for —. Woffenden; house and garage, Grand-avenue, W. Weller, for W. Weller; houses and garage, St. Lawrence-avenue, for B. Barry; house and garage, Mill-road, A. Clare, for M. J. Huxtable.

WHARFEDALE.—The Ministry of Health has decided to hold an inquiry into the application of the R.D.C. to borrow £2,000 towards the cost of draining the newly developed garden city at Cookridge, on the outskirts of Leeds.

WHITBY.—Plans passed by R.D.C.: Bungalow, near Cross Keld, for Captain W. Estill, architect Mr. H. P. Hopkins; house, Lowdale, Sleights, for H. Richardson, architect Mr. G. S. French; bungalow, Glaisdale, for Mr. H. Fry, "Marieville," architect Mr. W. R. Robinson.

YORK.—Plans passed by T.C.: T. Belt, two houses, Lime-avenue; G. H. Pegg & Son, five houses, Cameron-grove; and Mrs. Taylor, house, Moorgate.

FIRE.

CLACTON.—On Friday last the electric power station of the U.D.C. was destroyed by fire.

New Premises, Holborn, E.C. MESSRS. GILBERT & CONSTANDUROS, Architects.

NEW BUILDINGS IN LONDON.

Old Broad-Street.—REBUILDING.—Messrs. Lazard Bros. & Co., Ltd., Bankers, of Old Broad-street, are having their premises rebuilt. Messrs. Gunton & Gunton, of Finsbury House, E.C.2, in conjunction with Mr. A. V. Heal, of 11, Gray's Inn-square, W.C.1, are the architects for the work.

Threadneedle-street.—INSURANCE OFFICES.—A new head office is now being erected for the Eagle Star & British Dominions Insurance Co., Ltd., at 1 and 2, Threadneedle-street, E.C. The architects for this work are Messrs. Gunton & Gunton, of Finsbury House, E.C.2, in conjunction with Mr. A. H. Moore, F.R.I.B.A., of 11, Dowgate-hill, Cannon-street, E.C.

Arthur-street West.—OFFICE BUILDING.—Messrs. Gunton & Gunton, of Finsbury House, E.C.2, are the architects for a new block of business premises in Arthur-street West, E.C., to be known as King William-street House. The site covers about 16,000 ft. super.

Seven Sisters-Road.—SHOWROOMS AND OFFICES.—New showrooms and offices are to be built in Seven Sisters-road for the Gas Light & Coke Co. The back portion of premises will be completed first, i.e., general stores, &c., and the showrooms later. The elevation is in red facings with Portland stone dressings, &c. The floors will be fireproof and flat roofs will be used. No sub-contracts have yet been placed. Messrs. Dove Bros., of Cloudesley-place, N.1, are the builders.

Strand.—REBUILDING.—Messrs. Gunton & Gunton, of Finsbury House, E.C.2, are the architects for the rebuilding of 112, Strand.

Tufton-street.—GENERAL OFFICES.—Mr. C. W. Ferrier, of 11, Waterloo-place, Pall Mall, is the architect for the Mary Sumner House, Tufton-street, S.W.1. The interior of the chapel is the work of Mr. Paul Waterhouse, P.P.R.I.B.A. These offices are being erected for the Mothers' Union. It consists of five floors with a flat roof, upon which it is subsequently intended to add an attic story, and comprises the general offices, together with an assembly room seating 250 persons, a chapel, library and some residential accommodation. Messrs. Perry & Co. (Bow), Ltd., are the builders and the structural steelwork is being carried out by Messrs. Drew-Bear, Perks & Co., Ltd.

Cannon-street.—FIRE STATION.—Messrs. C. P. Roberts & Co., Ltd., builders, of Tyssen-street, Dalston-lane, E.8, are carrying out various alterations required by the L.C.C. for altered accommodation. The steelwork is being executed by Messrs. C. A. & A. W. Haward, of 171, King's Cross-road, W.C.1.

LONDON MASTER BUILDERS' SPORTS' ASSOCIATION.

(FOOTBALL SECTION.)

League Table up to and including Dec. 29, 1923.

	P.	W.	L.	D.	GOALS F.	GOALS A.	Pts.
Perrycobow	10	8	1	1	42	12	17
Trocoll	7	4	1	2	46	8	10
Holancube	8	3	2	3	16	10	9
Holloways.....	7	4	2	1	7	7	9
Minter	6	3	3	0	20	13	6
Higadillo	7	3	4	0	11	30	6
Higgs	10	3	7	0	21	33	6
Vigor	5	1	4	0	10	20	2
Whitehead	8	1	6	1	11	61	2

THE SCOTTISH BUILDER

THE EDINBURGH DISTRICT PROPERTY MARKET.

DOWELL'S annual review of the heritable property market for 1923, issued on January 1 from 18, George-street, Edinburgh, gives a distinct indication that the property market is in a healthy state. The transactions noted show that the demand has been for occupation, and there is little evidence that the sales have been for speculative purposes or re-sales, though there has been a certain amount of investment in tenement property. The sales of town properties have increased, but there has been little demand for large houses in prominent streets and squares of the West End. Not a few of these have been converted into flats. The demand for flats and small houses, where possession can be given, is unabated. Many that have changed hands have done so at twice the pre-war figure. Important sales have also been made in commercial premises in Princes-street. A good demand for small residential estates in the country is recorded. Should agriculture be encouraged by the Government, there might be more demand for agricultural estates.

In town property, 152 lots sold realised £166,105, the increase on upset price being £11,000; the 52 lots sold privately realised £94,580. Of country property, 45 lots changed hands, realising £87,286, an increase on the upsets of £7,473; nine lots sold privately realised £29,385.

The Burgh Assessor's return for the year 1923-24 of the valuation of Greater Edinburgh is as follows:—

Dwelling-houses, business premises, public buildings, churches, &c.	£4,472,297	0	9
Railways, street tramways, harbours and docks, gas, electric lighting, water, sewers, telegraph and telephone wires	780,934	2	2
	£5,253,231	2	11

The total increase on the previous year is £159,730 8s. 7d.

The number of unoccupied houses is 305 with a total rental of £13,676 2s. 7d.; and the number of unoccupied shops is 67, with a total rental of £2,436.

The most important buildings for which warrants have been granted during the past year are: Seafield-road, British Oxygen Co., Ltd., £8,000; Hawkhill, Leith, J. K. Smith, bakery, £16,000; Princes-street, Messrs. D. S. Crawford, alterations, £13,000; Spring-gardens, Maternity Hospital, £30,000; Princes-street, Messrs. J. W. Mackie & Son, Ltd., alterations, £30,000; Stewart-terrace, Messrs. McVitie & Price, bakery additions, £8,000; Gorgie tenements, £40,000; Grassmarket tenements, £10,000; St. Leonard's-hill, James Clark Technical School, additions, £14,500; Charlotte-square, Ladies' Caledonian Club, alterations, £8,000; South Bridge British Linen Bank, £21,000; Granton, Caroline Park, Messrs. A. B. Fleming & Co., Ltd., additions to works, £11,000; Leith War Memorial (Children's Hospital), £27,000; Newcraighall, Workmen's Institute, £7,000; Westbank, Portobello, transformer house, £9,250; Dean Distillery, converting to bonded warehouse, £7,000; Castle-terrace, Synod Hall, reconstruction, £8,000; Wardie tenements, £14,750; Bryson-road, Edinburgh and Dumfries-shire Dairy Co., Ltd., alterations and additions, £16,000; Hope-street, Royal Bank of Scotland, £65,000; St. Clair-street, Leith, tenements, £23,130; Bellevue Technical School, £30,000; Leith, James-place, school, £30,000; Newcraighall, Benhar Coal Co., housing scheme, £20,160; Semple-street, St. Cuthbert's Co-operative Society, garage and workshops, £25,000; The Castle, Scottish National War Memorial, £50,000.

In the City of Edinburgh "Accounts," just published, the total expenditure amounts to nearly five millions sterling.

NEW BUILDINGS IN SCOTLAND.

Paisley.—FACTORY BUILDING.—The Dean of Guild has passed plans for the British Cotton and Wool Dyers' Association, 22, Cumberland-street, Deansgate, Manchester, to erect a stuff-house at Laighpark.

Stornoway.—HOUSES.—The Ross-shire C.C. has granted permission to the Lewis (Stornoway) District Committee to erect 28 houses, at a cost of £600 each.

Kingseat.—HOUSES.—The Kingseat Mental Hospital Committee of the Aberdeen City Board of Control has recommended the erection of two new houses and an addition to the nurses' home.

Edinburgh.—LABORATORY.—The Rockefeller trustees have offered £50,000 towards the erection of a clinical laboratory at the Edinburgh Royal Infirmary.——The Dean of Guild Court has approved of the reconstruction of existing premises for out-patients at Leith Hospital, Mill-lane.

Leith.—TOWN HALL AND LIBRARY.—The Lord Provost's Committee of Edinburgh T.C. has recommended the Council to provide a town hall and library for Leith.

Brighouse.—CHURCH HOUSE.—A church house is to be provided at Brighouse.

Crombie.—JANUARY 12-16.—SCHOOL.—Proposed new school to be erected at Crombie, near Dunfermline, for the Fife Education Authority. Mr. G. G. Storrar, architect, Cupar. Mr. J. Gentles, surveyor, Central Chambers, High-street, Kirkcaldy. £1 1s.

Aberdeen.—JANUARY 14.—HOUSES.—Four blocks, each containing 12 dwellings, in connection with Cattofield Housing Scheme, for the Town Council. All particulars from Mr. Coutts, Housing Dept., Town House, Aberdeen.

Royal Scottish Academy.

Mr. G. Washington Browne, R.S.A., was recently elected President of the Royal Scottish Academy in place of Sir J. Lawton Wingate, who has resigned.

He received his early training in Glasgow and afterwards served under London architects and gained the Pugin Travelling Studentship.

Mr. Browne designed the King Edward Memorial at Holyrood, which the King unveiled in the autumn of 1922; also the Edinburgh Public Library, and numerous war memorials throughout Scotland.

Yarrow Church.

This church (built in 1640), which was destroyed by fire last year, has now been re-opened.

New Docks for Glasgow.

Some years ago the Clyde Navigation Trustees acquired an area of land on the south side of the Clyde between Shieldhall and Renfrew having a frontage of about 1¾ miles. The first step has now been taken towards the construction of new tidal docks on this site, and tenders have been invited for the construction of a length of 1,900 yards of the quay wall of what will be No. 1 dock. A contract has already been let to Messrs. Sir Robert McAlpine & Sons for road works, and to Gray's Ferro Concrete Company for bridge work in connection with the scheme.

Three reinforced concrete bridges will be required to carry the new road over the railway which will serve the new dock, and to provide for the accommodation of the existing Renfrew District Railway, which will be diverted for a portion of its length. Two of the bridges will be four-span structures, while the third bridge will consist of two spans. All the bridges are being designed on the Considère system, and will make provision for the passage of heavy traffic to and from the docks.

BUILDING TRADE WAGES IN SCOTLAND.*

THE following are the present rates of wages in the building trade in the principal towns of Scotland. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Brick layers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Brick-layers' Labourers.	Plasterers' Labourers.
Aberdeen	1/7	1/8	1/7	1/8	1/7	1/7	1/4½	1/-	
Airdrie	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Alexandria	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Arbroath	1/7	1/6	1/6	1/7	1/6	1/6	1/5	1/1	
Ayr	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Bathgate	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/1 to 1/2	
Blairgowrie	1/7	—	1/7	1/7	1/7	1/7	1/6½	—	
Bo'ness	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Coatbridge	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Dumbarton	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Dumfries	1/5	1/5	1/5	1/6	1/5	1/6	1/5	1/1 to 1/2	
Dundee	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Dunfermline	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Edinburgh	1/7	1/7	1/7	1/8	1/8	1/7	1/6½	1/2½	
Falkirk	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Fort William	1/7	1/6	1/6	1/7	1/6	1/6	1/6½	1/1½	
Galashiels	1/5	1/5	1/5	1/6	1/5	1/5	1/5½	1/1	
Glasgow	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Greenock	1/7	1/7	1/7	1/8	1/7	1/7	1/5½	1/1 to 1/2½	
Hamilton	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Hawick	1/5	1/5	1/5	1/6	1/5	1/5	1/5½	1/1½	
Helensburgh	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Inverness	1/3½	—	1/3	1/4	1/4½	1/4	1/3½	10d. to 1/2	
Kilmarnock	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Kirkcaldy	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Kirkwall	1/7	1/5	1/3	1/4	1/4	1/4	1/4	1/-	
Lanark	1/7	1/7	1/7	1/8	1/7	1/7	1/5½	1/2½	
Leith	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Motherwell	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Perth	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Stirling	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Stirlingshire (Eastern District)	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Wishaw	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	

* The information given in this table is copyright. The rates of wages in the various towns in England and Wales are given on page 85.

PRICES CURRENT OF MATERIALS.*

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.—Ed.]

BRICKS, &c.

Per 1,000 Alongside, in River Thames up to London Bridge.

	£	s.	d.
Best Stocks	3	19	0
Second Hard Stocks	3	14	0

Per 1,000. Delivered at London Goods Stations.

	£	s.	d.
Flettons, at King's Cross	2	13	3
Do. grooved for plaster	2	15	3
Do. Bullnose	3	8	3
Best Stourbridge Fire brick :—			
2½ in.	11	3	0

	£	s.	d.
Best Blue Pressed Staffs.	9	0	0
Do. Bullnose	9	10	0
Blue Wire Cuts	7	0	0
3 in.	13	2	0

GLAZED BRICKS—

	£	s.	d.
Best White Ivory, and Salt Glazed Stretchers	22	0	0
Headers	21	10	0
Quoins, Bullnose and 4½ in. Flats	28	10	0

	£	s.	d.
D'ble Str'tch'rs	30	10	0
D'ble Headers	27	10	0
One Side and two Ends	31	10	0
Two Sides and one End	32	10	0
Splays and Squints	30	0	0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, Hard Glaze, £5 10s. extra over white.

BREEZE CONCRETE SLABS.

Delivered London.

	s.	d.		s.	d.
2 in. per yd. super	2	0	3 in. per yd. super	2	11
2½ in. "	2	6	4 in. "	3	6

	s.	d.	
Thames Ballast	10	6	per yard.
Pit Sand	14	9	" "
Thames Sand	15	6	" "
Best Washed Sand	15	6	" "
½ in. Shingle for Ferro-Concrete	14	0	delivered 2 miles radius Paddington.
¾ in. "	15	0	" "
½ in. Broken Brick	10	6	" "
Pan Breeze	5	6	"

Per ton delivered in London area in full van loads.

Best Portland Cement, British Standard Specification Test £2 18 0 to £3 3 6 51/– alongside at Vauxhall in 80-ton lots.			
Ferrocrete per ton extra on above	0	10	0
Super Cement	4	8	0
Roman Cement	8	15	0
Parian Cement	5	15	0
Keene's Cement, White	5	15	0
" " Pink	5	10	0
Plaster, Coarse, Pink	3	0	0
" " White	3	12	6
" Fine	5	12	0
Sirapite, Coarse	3	9	6
" Finish	3	17	6
Grey Stone Lime	2	10	9
Chalk Lime	2	10	9
Best Ground Blue Lias Lime	2	13	6
Hair	17	0	0
Granite Chippings	1	12	0

NOTE.—Sacks are charged 1s. 9d. each and credited 1s. 6d. if returned in good condition within three months, carr. pd.

Stourbridge Fireclay in s'cks 35s. 0d. per ton at rly. dpt.

STONE.

BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube — s. 2, d. 9½

Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube — s. 2, d. 11½

PORTLAND STONE—

Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L. & S.W.R., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube — 4 4

Do. do. delivered on road wagons at above stations, per ft. cube — 4 5

White basebed, 3d. per ft. cube extra.

NOTE.—½d. ft. cube extra for every foot over 20 ft. *average*, and ½d. beyond 30 ft.

HOPTON-WOOD STONE.

Delivered at any Goods Station, London.

Small random blocks, up to 10 ft. cube. Per ft. cube	7/–
Random blocks from 10 ft. and over "	17/–
Sawn two sides "	27/–
Sawn three or four sides "	32/–

YORK STONE, BLUE—*Robin Hood Quality.*

Delivered at any Goods Station London.

	s.	d.
6 in. sawn two sides landings to sizes (under 30 ft. super.) Per Ft. Super	5	3
6 in. rubbed two sides, ditto "	5	9
2 in. sawn two sides slabs (random sizes) "	2	1½
2 in. to 2½ in. sawn one side slabs (random sizes) "	1	5½
1½ in. to 2 in. ditto, ditto "	1	3

HARD YORK—

Delivered at any Goods Station London.

Scappled random blocks Per Ft. Cube	5	6
6 in. sawn two sides landing to sizes (under 40 ft. super.) Per Ft. Super	5	4½
6 in. rubbed two sides ditto "	6	0½
4 in. sawn two sides slabs (random sizes) "	2	10
3 in. ditto. ditto "	2	5
2 in. self-faced random flags. Per Yard Super	7	11

ARTIFICIAL STONE.

Delivered in London Area in full van loads.

	s.	d.
Plain per ft. cube	6	6
Moulded " "	7	9
Cills " "	8	3

WOOD.

GOOD BUILDING DEAL.

Inches.	per stan.	Inches.	per stan.
4 × 11	£34 0	3 × 6	£25 0
4 × 9	34 0	3 × 11	34 0
4 × 8	29 0	2 × 11	34 0
4 × 7	28 0	3 × 9	33 0
3 × 8	26 10	2½ × 9	33 0
3 × 7	26 0	3 × 4½	24 0
2½ × 7	26 0	3 × 4	24 0

WOOD (*Continued*).

PLANED BOARDS.

1 × 11	£38 10	1 × 9	£36 0

PLAIN EDGE FLOORING.

Inches.	per sq.	Inches.	per sq.
½	21/–	1½	33/6
¾	23/–	1¾	38/6
1	26/6		

TONGUED AND GROOVED FLOORING.

Inches.	per sq.
1	26/6
1¼	33/6
1½	38/6

MATCHINGS (BEST).

Inches	per sq.
½	17/6
¾	22/–
1	26/–

Inches	BATTENS	s.	d.
¾ × 2	per 100 ft.	2	4

SAWN LATHS.

Per bundle				0	2 10
Dry Wainscot Oak, per ft. super, as inch	0	2	0 to	0	2 6
¼ in. do. do.	0	1	6 to	0	2 0
Dry Mahogany—Honduras, Tabasco, African, per ft. super, as inch	0	1	9 to	0	2 6
Cuba Mahogany	0	3	0 to	0	3 6
Teak (Rangoon, Moulmein or Java), per load	45	0	0 to	50	0 0
American Whitewood planks, per ft. cube	0	14	0 to	0	16 0
Best Scotch Glue, per cwt.	4	10	0 to	—	
Liquid Glue, per cwt.	4	7	0 to	5	10 0

SLATES.

1st quality slates from Bangor or Portmadoc in truck loads delivered London area. Per 1,000 of 1,200.

	£	s.	d.		£	s.	d.
24 by 12	37	12	6	18 by 10	21	2	6
22 by 12	34	0	0	18 by 9	18	12	6
22 by 11	31	5	0	16 by 10	17	12	6
20 by 12	29	15	0	16 by 8	13	15	0
20 by 10	25	12	6				

TILES.

	Per 1,000 f.o.r. London. £	s.	d.
Best machine-made tiles from Broseley or			
Staffordshire district	5	7	6
Ditto hand made ditto	5	12	6
Ornamental ditto	5	17	6
Hip and valley tiles (per dozen) Hand made	0	9	6
Hip and valley tiles (per dozen) Machine made	0	9	0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

	£	s.	d.
R. S. Joists, cut and fitted	13	10	0
Plain Compound Girders	15	10	0
Stanchions	17	10	0
In Roof Work "	20	10	0

MILD STEEL ROUNDS.

To London Station, per ton.

Diameter.	£	s.	d.	Diameter.	£	s.	d.
½ in.	16	10	0	⅜ in. to ½ in.	13	10	0
⅜ in.	14	10	0	½ in. to 2½ in.	13	0	0

WROUGHT-IRON TUBES AND FITTINGS—

(Discount off List for lot of not less than £7 net value delivered direct from Works, 2½ per cent. less above gross discounts, carriage forward if sent from London Stocks.)

	Tubes.	Fittings.	Flanges.
Gas	52½%	52½%	62½%
Water	47½%	47½%	57½%
Steam	42½%	42½%	52½%
Galv'd—			
Gas	37½%	42½%	52½%
Water	31½%	37½%	47½%
Steam	25 %	32½%	42½%

C.I. HALF-ROUND GUTTERS—London Prices, ex Works.

Per yd. in 6 ft. lengths.	Gutters.	Angles and Nozzles.	Stop Ends.
3 in.	1/1½	11d.	3½d.
3½ in.	1/2½	1/0½	3½d.
4 in.	1/4	1/1½	3½d.
4½ in.	1/5½	1/4	4d.
5 in.	1/7½	1/5½	5d.

O.G. GUTTERS.

3 in.	1/6½	1/2½	3½d.
3½ in.	1/6½	1/2½	3½d.
4 in.	1/7½	1/4	3½d.
4½ in.	1/9½	1/6½	4d.
5 in.	2/1½	1/9	5d.

RAIN-WATER PIPES, &c.

Per yd. in 6 fts.	Pipe.	Bends, stock angles.	Branches, stock angles.
2 in. plain	1/7½	1/1½	1/8
2½ in. "	1/9½	1/4	2/0½
3 in. "	2/1½	1/8	2/5½
3½ in. "	2/6½	1/11½	2/10½
4 in. "	2/11½	2/4½	3/5½

L.C.C. COATED SOIL PIPES—London Prices ex works.

	Pipe. s.	d.	Bends, stock angles. s.	d.	Branches, stock angles. s.	d.
2 in. per yd. in 6fts plain	3	0½	2	2½	2	8
2½ in. "	3	6½	2	5½	3	3½
3 in. "	4	2½	2	8	4	0½
3½ in. "	4	7	3	3½	4	8½
4 in. "	5	1	3	9½	5	5

L.C.C. COATED DRAIN PIPES—London Prices ex works.

	Pipe. s.	d.	Bends, stock angles. s.	d.	Branches stock angles. s.	d.
3 in. per yd. in 9ft. lengths	4	9	5	8	8	10
4 in. "	6	3	6	8	11	4
5 in. "	7	6	11	6	18	2
6 in. "	8	10	14	4	23	5

IRON—	Per ton in London. £	s.	d.		£	s.	d.
Common Bars	13	10	0	to	14	10	0
Staffordshire Crown Bars—good merchant quality	14	0	0	..	15	0	0
Staffordshire "Marked Bars"	17	0	0	..	18	0	0
Mild Steel Bars	12	10	0	..	13	10	0

METALS (*Continued*).

	£	s.	d.		£	s.	d.
Steel Bars, Ferro-Concrete quality, basis price	13	0	0	..	14	0	0
Hoop Iron, basis price	16	10	0	..	17	10	0
" Galvanised	31	0	0	..	32	0	0
Soft Steel Sheets, Black—							
Ordinary sizes to 20 g.	15	0	0	..	16	0	0
" " " 24 g.	16	0	0	..	17	0	0
" " " 26 g.	18	0	0	..	19	0	0
Sheets Flat Best Soft Steel, C.R. & C.A. quality—							
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	21	10	0	..	22	10	0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 22 g. and 24 g.	22	10	0	..	23	10	0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 26 g.	24	10	0	..	26	10	0
Flat and Galvanised Corrugated Sheets—							
Ordinary sizes, 6 ft. to 9 ft. to 20 g.	21	10	0	..	22	10	0
Ordinary sizes, 6 ft. to 9 ft. to 22 g. and 24 g.	22	0	0	..	23	0	0
Ordinary sizes, 6 ft. to 9 ft. to 26 g.	24	0	0	..	25	0	0
Sheets Galvanised Flat, Best quality—							
Best Soft Steel Sheets, 6ft. by 2ft. to 3ft. to 20g. and thicker	23	10	0	..	24	10	0
Best Soft Steel Sheets, 22 g. and 24 g.	24	10	0	..	26	10	0
Best Soft Steel Sheets, 26 g.	26	0	0	..	27	0	0
Cut Nails, 3in. to 6 in. (under 3in. usual trade extras.)	20	10	0	..	22	0	0

METAL WINDOWS—Standard sizes suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1/4 to 1/7 per foot super.

LEAD, &c.

(Delivered in London.)

	£	s.	d.
LEAD—Sheet. English, 4 lb. and up	41	10	0
Pipe in coils	42	0	0
Soil Pipe	45	0	0
Compo pipe	47	10	0

NOTE—Country delivery, 30s. per ton extra: lots under 3 cwt., 2s. per cwt. extra and over 3cwt. and under 5 cwt., 1s.6d. per cwt. extra. Cut to sizes, 2s. cwt. extra.

Old lead, ex London area, at Mills per ton	27	0	0	..	—
Do., ex country, carriage forward per ton	28	0	0	..	—

PLUMBERS' BRASS WORK.

Delivered in London.

NEW RIVER PATTERN SCREW DOWN BIB COCKS FOR IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
29/	45/–	76/-	153/-	246/-	510/- per doz.

NEW RIVER PATTERN SCREW DOWN STOP COCKS AND UNIONS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
41/6	62/–	92/-	174/-	300/-	588/- per doz.

NEW RIVER PATTERN SCREW DOWN MAIN FERRULES.

½ in.	¾ in.	1 in.
39/6	60/–	116/6 per doz.

CAPS AND SCREWS.

1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
7/6	10/–	14/-	23/-	30/-	42/- per doz.

DOUBLE NUT BOILER SCREWS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2in.
7/6	11/6	17/–	29/-	36/-	63/- per doz.

BRASS SLEEVES.

1¼ in.	2 in.	3 in.	3½ in.	4 in.
10/–	12/–	20/–	24/-	31/- per doz.

NEW RIVER PATTERN CROYDON BALL VALVES, S.F.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.
35/–	56/–	98/-	162/-	228/- per doz.

DRAWN LEAD P. & S. TRAPS WITH BRASS CLEANING SCREW.

	1½ in.	1½ in.	2 in.	3 in.
8 lbs. P. traps	33/–	41/–	56/-	101/- per doz.
8 lbs. S. traps	35/–	45/–	66/-	126/- "

COPPER—	£	s.	d.		
Strong Sheet per lb.	0	2	3	..	—
Thin " "	0	2	4	..	—
Copper nails "	0	2	3	..	—
Copper wire "	0	2	4	..	—
TIN—English Ingots "	0	2	6	..	—
SOLDER—Plumbers' "	0	1	1	..	—
Tinmen's "	0	1	3	..	—
Blowpipe "	0	1	5	..	—

PAINTS, &c.

	£	s.	d.
Raw Linseed Oil, in pipes per gallon	0	3	10
" " " in barrels "	0	4	0
" " " in drums "	0	4	3
Boiled " " in barrels "	0	4	4
" " " in drums "	0	4	3
Turpentine in barrels "	0	6	6
" in drums (10 gall.) "	0	6	9
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)	56	5	0

GENUINE WHITE LEAD PAINT—

"Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Spedol" and other best brands (in 14 lb. tins) not less than 5 cwt lots

per ton delivered	70	10	0
Red Lead, Dry (packages extra) per ton	43	0	0
Best Linseed Oil Putty per cwt.	0	16	0
Filocot per cwt.	0	15	6
Size. XD Quality fkn.	0	3	6

[Concluded on next page.]

* The information given on this page has been specially compiled for THE BUILDER and is copyright. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

PRICES CURRENT OF MATERIALS (*contd.*)

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

	Per Ft.		Per Ft.
15 oz. fourths	3½d.	32 oz. fourths	8½d.
15 „ thirds	4½d.	32 „ thirds	10½d.
21 „ fourths	5d.	Obscured Sheet, 15 oz.	4d.
21 „ thirds	6½d.	„ „ 21 „	5½d.
26 „ fourths	6d.	Fluted 15oz. 6½d., 21oz.	9½d.
26 „ thirds	7½d.	En'lled 15oz. 5½d., 21oz.	7½d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

		Per Ft.
⅛	Rolled plate	4½d.
3/16	Rough rolled	5½d.
¼	Rough rolled	5½d.
	Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white	6½d.
	Ditto, tinted	9d.
	Rolled Sheet	6d.
	White Rolled Cathedral	5½d.
	Tinted do.	7½d.

Cast Plate is same price as rough rolled.

VARNISHES, &c.

		Per gallon. £ s. d.
Oak Varnish	Outside	0 14 0
Fine ditto	ditto	0 16 0
Fine Copal	ditto	0 18 0
Pale Copal	ditto	1 0 0
Pale Copal Carriage	ditto	1 4 0
Best Ditto	ditto	1 12 0
Floor Varnish	Inside	0 18 0
Fine Pale Paper	ditto	0 18 0
Fine Copal Cabinet	ditto	1 2 6
Fine Copal Flatting	ditto	1 0 6
Hard Drying Oak	ditto	0 18 0
Fine Hard Drying Oak	ditto	0 19 0
Fine Copal Varnish	ditto	1 0 0
Pale ditto	ditto	1 2 0
Best ditto	ditto	1 12 0
Best Japan Gold Size		0 12 0
Best Black Japan		0 12 0
Oak and Mahogany Stain (water)		0 12 0
Brunswick Black		0 9 0
Berlin Black		0 14 0
Knotting (patent)		1 5 6
French and Brush Polish		0 17 0
Liquid Dryers in Terebine		0 9 0
Cuirass Black Enamel		0 7 0

NEW INVENTIONS

The "Borwood" Bit.

We have received some particulars regarding the new patent "Borwood" bit, which is claimed to bore holes quicker than ordinary bits with less pressure and to leave the walls smooth and clean, as if they had already been sandpapered. The manufacturers state: "The bit is simply and strongly built, and is designed for use by machine or hand. The work it does is briefly as follows:—(1) Boring; (2) boring taper holes; (3) boring a countershaft in one operation; (4) making mouldings or sinkings of any circular design. The secret of the 'Borwood' bit lies in its design. Essentially simple in its construction, it is an all-round improvement on the ordinary boring bit.

"Owing to the depths of its shanks, the bit bores equally well across or end grain, and there is no danger of wandering even where it meets other holes or soft patches. It bores safely through any number of thicknesses, and through single unsupported thin boards. It is the only boring bit which will bore within a sixteenth-of-an-inch of the edge of the work without bursting the sides. After boring the job requires practically no cleaning up. The edges can easily be reached either with a file or an oil slip, and although it may have lain idle for months on end it can be restored to first-class condition in less than five minutes. The easy way in which they can be reached enables the cutting edges to be shaped as best suits the class of boring being done. The two routers are balanced so that there is an equal pull on both sides. Two cuts are taken for each revolution of the head. This construction allows ample room for clearance, and practically eliminates the risk of burning and choking. It is manufactured from special cast-steel, scientifically hardened and tempered to give durability. It can be run at high speeds with consequent increased production.

"The bit is made either with or without a centre. When a centre is provided it may be the ordinary screw pattern which takes hold of the wood and draws the bit after it. A special patent bit has been designed to obviate any danger of the work flying round on the bit. This new centre enters the wood freely, but it does not control the feed. In this way the operator is able to make a heavy or light cut at will, according to the class of work on which he is engaged. This bit is easily withdrawn from the hole without the necessity of reversing or the possibility of tearing. Unless specially mentioned the bit is supplied with this new centre in all cases where bits are ordered for machine use. For hand use the ordinary centre is provided.

"For moulding purposes the bit is an adaptation of the boring-bit. Almost any design of circular moulding can be made within a very short space of time.

"After the bit has been withdrawn it requires practically no cleaning up."

The manufacturers are the Borwood Tool Co., Ltd., Ditton Works, Newmarket-road, Cambridge.

The "Borwood" Bit.

New Staircase.

The new type of staircase illustrated above has been put on the market by the Light Steelwork, Ltd., 178, York-road, King's Cross, W. 1.

New Staircase.

The treads and risers are formed in one piece out of steel plate bent to shape. The sections are then riveted together and connected to a steel string by means of angle cleats built into or otherwise attached to walls as the case may be. When these individual sections are riveted together they form a series of trays or centering, and small studs or caulkings are provided to act as keys for the material or filling destined for the tread or wearing surface proper. This filling may be of granolithic, with a dusting of carborundum to make it non-slipping, or any suitable substitute of a hard-wearing or non-slipping nature. The steel sections thus perform three functions, viz., first, as permanent centering; second, as structural support; and thirdly, as the tensile member of a beam with the material used for filling under compression.

If desired, the risers may be coated with the same material as the tread, but in this case the top edge of each bent plate would be notched or serrated to act as a key for the nosing by allowing the filling of the tread to unite firmly with the riser covering. If it is considered desirable the underside of the stairs can be provided with expanded metal or other suitable lathing wired to the structure, which, when plastered, will form a soffit to the underside of the stairs. The same method is employed for the construction of winders and landings, each winder or landing being a tray of steel filled in with the composition selected and properly stiffened or supported to impart the necessary strength.

The manufacturers of this system of staircase construction claim several advantages to be gained by its use:—(1) Low cost of carriage owing to lightness; (2) Low cost of erection, because flights and landings, each in one piece, can be delivered to the site ready for hoisting into position and bolting or riveting together; (3) Time saved in erection; (4) Fire-resisting qualities; (5) In its simplest form the cost compares favourably with any other type; (6) It is especially suitable for use for area stairs where there is a risk of heavy weights being dropped; (7) It will carry safely very much greater loads than can be placed upon staircases in ordinary circumstances.

Where a staircase is to be fixed between walls, steel strings are unnecessary. In this case the sections could be delivered riveted together, braced by steel or wood booms bolted together and long enough to be built into the walls during the progress of the work. After being erected into position and built in, the braces or booms can be removed, and the stairs are ready for filling in.

CURRENT PRICES FOR BUILDING WORK IN LONDON.*

EXCAVATOR.

		s.	d.
Digging and throwing or wheeling and filling carts, and carting away to shoot—6 ft. deep	per yard cube	11	6
Add if in clay	" "	1	0
Add for every additional depth of 6 ft.	" "	0	6
Planking and strutting to trenches	per foot super	0	5
Do. to sides of excavation, including shoring	" "	1	0

CONCRETOR.

		s.	d.
Portland cement concrete in foundation 1 to 6	per yard cube	35	0
Add if in underpinning in short lengths	" "	7	6
Add if in floors 6 in. thick	" "	3	6
Add if in beams	" "	4	0
Add if aggregate 1 : 2: 4	" "	10	0
Add for hoisting not exceeding 10 ft. beyond the first 10 ft.	" "	3	3

BRICKLAYER.

		£	s.	d.
Reduced brickwork in lime mortar and Fletton bricks	per rod	30	0	0
Add if in stocks	"	7	10	0
Add if in Staffordshire blues	"	22	0	0
Add if in Portland cement and sand	"	2	0	0

FACINGS.

		s.	d.
Extra for facing in English or Flemish bond for every 10s. per 1,000 over the price of the common bricks	per ft. super	0	0	1½

POINTING.

		s.	d.
Neat flat struck or weathered joint	" "	0	0	3

ARCHES.

		s.	d.
Extra only to the price of ordinary brickwork :—			
Fair external in half brick rings	" "	0	0	10
Axed in stocks	" "	0	1	9
Rubbed and gauged jointed in putty camber or segmental	" "	0	6	0

SUNDRIES.

		s.	d.
Damp course in double course of slates breaking joint and bedded in Portland cement	" "	0	1	1
Setting ordinary register grates and stoves	each	1	0	0
Setting kitchener, including forming flues, &c., with all necessary fire bricks	"	4	15	0

ASPHALTER.

		s.	d.
Half-inch horizontal damp course	per yard sup.	4	3
Three-quarter-inch vertical damp course	" "	9	0
¾ inch on flats in two thicknesses	" "	6	6
Angle fillet	per foot run	0	3
Skirting and fillet 6 in. high	" "	1	3

MASON.

		s.	d.
York stone templates fixed	per foot cube	12	6
York stone sills fixed	" "	21	6
Bath stone and all labour fixed	" "	10	6
Portland stone fixed	" "	19	6

SLATER.

		s.	d.
Welsh 16 in. × 8 in. 3 in. lap, including nails	per square	72	9
Do. 20 in. × 10 in. Do. Do.	"	80	9
Do. 24 in. × 12 in. Do. Do.	"	90	0

CARPENTER AND JOINER.

		s.	d.
Fir framed in plates	per foot cube	5	3
Do. joists	" "	5	9
Do. roofs, floors and partitions	" "	6	3
Do. trusses	" "	8	3

		¾"	1"	1¼"	2"
Deal rough close boarding	per sq.	38/-	44/-	50/-	80/-

		s.	d.
Flat centering for concrete floor, including struts or hangers	"	50	0
Do. to beams	per ft. sup.	1	0
Centres for arches	"	1	6
Gutter boards and bearers	"	1	0

FLOORING.		¾"	1"	1¼"	1½"
Deal edges shot	per sq.		49/-	58/-	67/-
Do. tongued and grooved	"		54/-	65/-	72/-
Do. matchings	"	45/-	55/-		
Moulded skirting, including backings and grounds	per ft. sup.	1/6	1/9	2/0	2/6

SASHES AND FRAMES.

		s.	d.
One-and-a-half moulded sashes or casements	per foot super	1	10
Two Do. Do. Do.	" "	2	1
Add for fitting and fixing	" "	0	4
Deal-cased frames with 1 in. inner and outer linings, 1½ in. pulley stiles tongued to linings, hard wood sills with 2 in. moulded sashes in squares double hung, double hung with pulleys, lines and weights; average size	" "	3	9

DOORS.		1¼"	1¾"	2"
Two-panel square framed	per ft. sup.	2/1	2/4	2/6
Four-panel Do.	"	2/5	2/8	2/11
Two-panel moulded both sides	"	2/8	2/11	3/2
Four-panel Do. Do.	"	2/11	3/2	3/5

CARPENTER AND JOINER—continued.

FRAMES.

		s.	d.
Deal wrot moulded and rebated	per foot cube	14	0

		1"	1¼"	1½"
Plain deal jamb linings framed	per ft. sup.	1/8	1/9	2/0
Deal shelves and bearers	"	1/5	1/7	1/10
Add if cross tongued	"	2d.	2d.	2d.

STAIRCASES.

	1"	1¼"	1½"	2"	2½"
Deal treads and risers in and including rough brackets	2/1	2/4	2/9	—	—
Deal strings wrot on both sides and framed	1/8	2/-	2/2	2/8	—

		s.	d.
Housings for steps and risers	each	0	11
Deal balusters, 1 in. × 1¼ in.	per ft. run.	0	9
Mahogany handrail; average 3 in. × 3 in.	" "	6	0
Add if ramped	" "	11	10
Add if wreathed	" "	23	9

FIXING ONLY IRONMONGERY (INCLUDING SCREWS).

6 in. barrel bolts	8½d.	Rim locks	2/4
Sash fasteners	11½d.	Mortice locks	5/3
Casement fasteners	1/5	Patent spring hinges and letting in to floor and making good	19/-
Casement stays	1/2		
Cupboard locks	1/5		

FOUNDER AND SMITH.

		s.	d.
Rolled steel joists	per cwt.	17	0
Plain compound girders	"	20	0
Do. stanchions	"	23	0
In roof work	"	28	0

RAIN-WATER GOODS.

		3"	4"	5"	6"
Half-round plain rebated joints	ft. run	1/11	2/4½	3/7	4/-
Ogee Do. Do.	"	2/4½	3/1	3/10	4/9
Rain-water pipes with ears	"	2/9	3/7		
Extra for shoes and bends	each	4/4	5/11		
Do. stopped ends	"	1/11	2/4½	3/7	4/-
Do. nozzles for inlets	"	2/2	2/7	3/10	4/3

PLUMBER.

		s.	d.
Milled lead and laying in flashings and gutters	per cwt.	54	0
Do. Do. in flats	"	52	0
Extra labour and solder in coated cesspools	each	6	9
Welt joint	per ft. run.	0	6
Soldered seam	" "	1	6
Copper nailing	" "	0	6

		½"	¾"	1"	1½"	2"	4"
Drawn lead waste	per ft. run	11d.	1/8	1/11	3/5	4/2	
Do. service	"	1/7	2/1	2/6	3/10		6/10
Do. soil	"						
Bends in lead pipe	each					3/3	8/2
Soldered stop ends	"	1/2	1/8	2/1	2/10	3/6	
Red lead joints	"	11d.	1/-	1/3	1/11	2/4	4/10
Wiped soldered joints	"	2/10	3/6	4/-	4/11	6/6	9/9
Lead traps and cleaning screws	"				14/7	19/6	
Bib cocks and joints	"	6/4	9/7	15/4	41/-		
Stop cocks and joints	"	15/4	17/2	25/8	64/-		

PLASTERER.

		s.	d.
Render, float and set in lime and hair	per yard sup.	2	3
Do. Do. Sirapite	" "	2	6
Do. Do. Keen's	" "	3	6
Add sawn lathing	" "	1	5
Add metal lathing	" "	2	3
Portland cement screed	" "	1	10
Do. plain face	" "	3	0
Mouldings in plaster	per 1 girth	0	1
One-and-a-half granolithic pavings	per yard sup.	5	9

GLAZIER.

		s.	d.
21 oz. sheet plain	per foot sup.	0	9
26 oz. Do.	" "	1	1
Obscured sheet	" "	1	3
¼ in. rolled plate	" "	0	9
¼ in. rough rolled or cast plate	" "	0	11
¼ in. wired cast plate	" "	1	5

PAINTER.

		s.	d.
Preparing and distempering, 2 coats	per yard sup.	0	9
Knotting and priming	" "	0	7
Plain painting 1 coat	" "	0	9
Do. 2 coats	" "	1	2
Do. 3 coats	" "	1	9
Do. 4 coats	" "	2	4
Graining	" "	2	3
Varnishing twice	" "	1	9
Sizing	" "	0	3
Flatting	" "	0	7
Enamel	" "	1	1
Wax polishing	per foot sup.	0	6
French polishing	" "	0	2
Preparing for and hanging paper	per piece 2/- to 4/-		

* These prices apply to new buildings only. They cover superintendence by foreman and carry a profit of 10 % on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployment Acts and from 1s. 6d. per £100 for Fire Insurance. The whole of the information given on this page is copyright.

NEW COMPANIES.

THE particulars quoted below have been compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, of 116 & 117, Chancery-lane, W.C.2, from the documents available at the Companies' Registry.

DEMOLITION & EXCAVATION (GREENHAM), LTD. (193,688). Registered November 12. Rosebank Wharf, Fulham, S.W. To purchase from Henry J. Greenham, Ltd., of Rosebank Wharf, Fulham, S.W., demolition of buildings and excavation of land as heretofore carried on by them. Nominal capital, £1,000.

F. J. RASHBROOK, LTD. (193,670). Registered November 10. Elm Works, 68, St. Ann's-hill, Wandsworth, S.W. Builders, decorators, electrical engineers, &c. Nominal capital, £1,000.

SALTER BROS. (ELLESMERE PORT), LTD. (193,734). Registered November 13. Heath Farm, Whitby Heath, near Birkenhead. General contractors, builders' merchants, &c. Nominal capital, £600.

BATEMAN'S CONCRETE WORKS (SLOUGH), LTD. (193,650). Registered November 9. Bush House, Aldwych, W.C.2. To manufacture and sell all forms of pre-cast concrete, and to acquire by lease or otherwise certain lands situate at Salt Hill Gravel Pits, Slough. Nominal capital, £750.

J. PULLAN & SONS, LTD. (194,023). Registered November 27. 15A, Marley-terrace, Beeston, Leeds. Builders and contractors, now carried on by Ernest Pullan and Alfred Pullan at Beeston, Leeds, under the style of J. Pullan & Sons. Nominal capital, £3,000.

BLYTH, LTD. (194,035). Registered November 28. 360, High-road, Kilburn, N.W.6. Builders and contractors, &c. Nominal capital, £3,000.

ARCHITECTURAL TOWN-PLANNING ASSOCIATION, LTD. (194,014). Registered November 27. 27, Victoria-square, S.W.1. To promote, develop, and improve housing and town-planning schemes of all kinds in Great Britain. Nominal capital, £1,000.

RAZIP MANUFACTURING CO., LTD. (193,973). Registered November 23. 38, Deansgate, Manchester. Dealers and manufacturers of Razip paint, enamel, varnish and mosaic cleaners. Nominal capital, £1,000.

J. W. JONES & SONS, LTD. (193,952). Registered November 23. Builders and contractors. Nominal capital, £12,000.

JEFFERYES & CO., LTD. (193,984). Registered November 24. 10, Lower John-street, Regent-street, W. Plastering decorators, builders and contractors. &c. Nominal capital, £2,000.

CAMEL ASPHALTE CO., LTD. (193,870). Registered November 20. To acquire lands, mines, quarries, minerals and slate dumps in the county of Cornwall and turn same to account, quarry masters and stone and slate merchants, &c. Nominal capital, £17,500.

BEN THOMAS & CO., LTD. (193,867). Registered November 20. Lon Fach, Rhiwbina, near Cardiff. Builders, contractors, civil, sanitary, mechanical and general engineers, &c. Nominal capital, £1,000.

COUNTRY HOMES, LTD. (193,846). Registered November 19. 49, Beech-street, Barbican, E.C.1. General building contractors. Nominal capital, £500.

TEMPLE & PYLE, LTD. (194,162). Registered December 3. Hill Heads, Whitley Bay, Northumberland. Builders, contractors and plasterers carried on at Whitley Bay, Northumberland, under the style of Temple & Pyle. Nominal capital, £2,000.

REGAL ASBESTIC JOINTLESS FLOORING CO., LTD. (194,156). Registered December 3. 42, Drury-lane, W.C.2. To carry on the business of builders' and contractors' flooring specialists. Nominal capital, £500.

W. CREIGHTON & CO., LTD. (194,194). Registered December 4. Cassiobury Mills, Watford, Herts. Builders' material merchants, timber merchants, coal and coke merchants. Nominal capital, £5,000.

PATENTS.*

APPLICATIONS PUBLISHED.*

205,342.—T. G. Rhodes and R. Gaunt: Combined valve and siphon-discharge apparatus for flushing purposes.

204,351.—A. Parks: Flush-cisterns.

204,356.—A. Rustige and C. Kuhn: Baths.

204,392.—Moler Fireproof Brick & Partition Co., Ltd., and B. P. F. Deane: Manufacture of articles from clay, diatomaceous earth, and similar mineral substances.

204,403.—I. W. Thomas: Fastening or catch devices for boxes or receptacles having hinged or pivoted doors or the like.

193,372.—H. Kontzler: Production of hydraulic cement.

204,487.—W. S. Akerman: Roofing-tiles.

204,490.—F. G. Price: Corrugated roofing-sheets.

204,516.—J. E. Miller: Angle concrete bricks and blocks.

204,517.—E. Carvell: Wall plugs or fixing-blocks.

204,535.—J. Skelton, Sen., L. J. Skelton and J. Skelton, Jun.: Built-up metal towers, particularly those for crane stagings employed in the construction of buildings.

204,539.—J. Lightbown: Coping and parapet cradle or platform carriage.

204,544.—Sir F. Lobnitz and Lobnitz & Co., Ltd.: Subaqueous rock-cutting apparatus.

204,567.—L. Lichtenfeld: Parquet flooring.

204,583.—M. J. Dark and H. A. Dawes: Enamelled metal ties.

204,604.—O. Cosins and L. Cosins: Brick-moulding machines.

204,618.—A. H. T. Hainselin: Manufacture of cement flags, paving-blocks, and the like.

198,327.—H. V. Whitlock: Rope structures.

204,656.—G. H. Walchli and Kant-Break Ladder, Inc.: Ladders.

186,598.—H. R. Bliss: Method of constructing packing-cases.

204,659.—J. McArthur: Vehicle sash constructions.

196,906.—Soc. Anon. "La Ceramique Nationale": Apparatus for the manufacture of patterned or fancy tiles.

205,547.—H. V. Potter, F. J. Robinson, A. Lloyd, and Damard Lacquer Co., Ltd.: Pottery, porcelain and earthenware.

184,167.—G. Borle: Process for manufacturing a material for moulded articles, plates and floor covering.

205,575.—R. M. Maunder: Domestic fire-grates.

205,591.—Sir H. Austin. Covers or lap plates of panels used in connection with doors or drawers, or for other purposes.

205,626.—F. Cross and G. Fabris: Door-locks.

205,640.—W. Green and J. H. Dean: Wall tie.

205,642.—L. De Brouckere: Drawing and the like tables.

205,647.—T. O. Owen: Paving of roadways and footpaths.

205,661.—J. M. Dossor: Chimney and ventilating-shaft tops.

205,665.—W. Pratt: Staging-attachment for ladders and scaffolding.

205,679.—J. W. Wood: Apparatus for moulding concrete.

205,688.—H. E. Steinberg: Moulds for reinforced-concrete flooring.

205,701.—A. H. M. Basart: Door fastenings for safes.

205,712.—C. M. Trautschold and R. E. Pellow: Trestles.

205,720.—W. P. Carpmael (Naamlooze Vennootschap Korrelbeton Maatschappij voor Woningbouw in Poreuze Beton): Moulds for use in the erection of concrete buildings.

205,728.—Pavement Publicity, Ltd., and W. G. V. Vaughan: Paving slabs and flags.

205,744.—C. P. Elwell and S. P. Wing: Wireless masts or like structures.

* All these applications are now in the stage in which opposition to the grant of Patents upon them may be made.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach him not later than Tuesday evening.

* Denotes *accepted*. † Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modifications*.

ABERDOVERY.—For additions to Brynmorwydd, for Mr. F. Griffin. Mr. F. Howarth, architect, Towyn and Barmouth:—

Lewis & Griffith	£998
*Hugh Lewis & Jones	981

BATH.—For construction of relief storm water sewer from Bear Flat to Second-avenue, for the T.C.:—

*E. Ireland	£1,495

BATH.—For construction of sewer at Wildcombe, for the T.C.:—

*Axford & Smith	£439 10

BATH.—For the supply of water pipes to the T.C.:—

*Staveley Coal & Iron Co.. £11 5s. per ton for 2 in., and £10 5s. per ton for 3 in.

DEWSBURY.—Erection of main buildings at Mitchell Laithes in connection with the Sewage Works extension, for the Sewage Disposal Committee of the Corporation:—

*Wm. Scott & Sons, Dewsbury	£18,226 10 2

DONCASTER.—For erection of 19 houses in Oliver-road, for the T.C.:—

*G. T. Farrow	£6,942 9 5

DONCASTER.—For erection of 50 houses on the Warmsworth-road site, for the T.C. Mr. R. E. Ford, Housing Surveyor, 3, Priory-place, Doncaster:—

*F. Bate, Doncaster	£18,082

DURHAM.—For paving on reinforced concrete 3,800 super yds., No. 2 Section, for the Corporation. Surveyor, Council Offices, Durham:—

†Sir Wm. Prescott & Sons, Ltd., London	£10,663 9

FAREHAM.—For decorations in Earls-road, for the U.D.C.:—

*E. G. Moss	£148

FERRYBRIDGE.—Construction of foundations, &c., for new super generating station; also docks, sidings and other works, for the Yorkshire Electric Power Co., Ltd.:—

*The Foundation Co., Ltd., Kingsway, London.

GLAMORGANSHIRE.—For alterations and additions to Cowbridge Police Stations and Court, for the Glamorgan Standing Joint Committee. The Surveyor of Police Stations, Glamorgan County Hall, Cardiff:—

Bright & Addicot, Cardiff	£4,155 0 0
Ernest Clarke, Bridgend	4,055 0 0
Penarth Building Co., Penarth	4,000 0 0
Thornton Hall, Cardiff	3,990 0 0
*R. E. J. Haines & Sons, Cardiff	3,894 0 0
Surveyor's estimate	3,765 9 9

HASTINGS.—For construction of a road at Ore, for the T.C. Mr. P. H. Palmer, Borough Engineer, Hastings:—

*Jno. Carter, Hastings	£1,168

HAWARDEN.—New banking premises for the Midland Bank Limited. Messrs. Woolfall & Eccles, architects, Liverpool:—

Asphalte work—Thos. Faldo & Co., Ltd.

LEEDS.—For widening of existing bridges over the Leeds and Liverpool Canal, for the L.M. & S. Railway Co., giving improved access into the Wellington Station:—

*John Butler & Co., Ltd., Stanningley, near Leeds.

ROCHDALE.—For paving Gate-street and Midhurst street, for the Paving Committee. Mr. W. H. Hickson, Town Clerk, Town Hall, Rochdale:—

*Wm. Shepherd & Sons, Ltd., Rochdale.

SALFORD.—For street works, for the T.C.:—

*Thomas Wilson, Pendleton—	
Street behind Co-operative Stores, &c., Pendleton	£661 7 11
Street behind Nos. 2–52, Romney-street	481 12 6
Street behind Littleton-road, &c.	518 2 4
Street behind Suffolk-street, &c.	448 6 3
Street behind Littleton-road, &c.	165 15 7
Street behind Nos. 55–67, Littleton-road, &c.	133 13 6
Street behind Nos. 69–79, Litton-road, &c.	114 4 4
Street behind Nos. 20–32, Suffolk-street, &c.	109 3 3
Street behind Nos. 34–46, Suffolk-street, &c.	109 3 3
*Samuel Willshaw, Higher Broughton—	
Street behind Nos. 1–39, Hollingwood-street, &c.	146 17 9

TORPOINT.—For carrying out new water scheme, for the U.D.C.:—

*T. Doney & Sons, Plymouth	£21,648
Engineer's estimate	20,786

TORQUAY.—For improvements at St. Marychurch-road corners, for the T.C.:—

*R. E. Narracott	£465 8 6

WALLASEY.—For erection of pump house and culvert, for the T.C.:—

*Chappell & Sons, Liverpool..... £18,996

WARRASEY.—Supply of 350 yds. of wrought-iron fencing and gates in connection with improvement of Rake-lane, for the T.C. :—

W. A. Parker & Co., Workington—fencing 7s. 9d. per lineal yd., and gates £9 12s. 6d. to £10 per pair.

WATFORD.—For erection of cottage and sinking well on the Radlett Outfall site, for the R.D.C. Surveyor, 9, Market-street, Watford :—

C. C. Swain, Watford	£1,030
J. Dennis, St. Albans	849
Tonge, Garston	835
James Goss, Watford	809
†Wiggs & Co., Radlett	775

WHITSTABLE.—For erection of eight houses, in Reservoir-road, for the U.D.C. Mr. J. Dunn, Surveyor, Council Offices, Whitstable :—

Rice & Sons, Margate	£3,952	0	0
H. G. Perry, Whitstable	3,694	4	3
A. Merton-Hughes, Hammersmith	3,341	12	6
*S. Reeves, Ltd., Whitstable	3,199	18	6

WROTHAM.—For erection of Council Offices, at Borough-green, for the U.D.C. Mr. F. T. Moss, Engineer and Surveyor, Borough-green, Wrotham :—

F. Pierce, Sevenoaks	£1,188
*W. H. Simonds & Son, Sevenoaks	1,150
Goodwin & Sons, Tunbridge Wells	1,097

DIARIES & CALENDARS.

Messrs. Stone & Co., Ltd., of Nonsuch Fire Brick and Tile Works and Potteries, Epsom and Ewell, Surrey, have issued a useful waistcoat-pocket diary for 1924. In addition to the diary section, which is conveniently arranged with one week to each opening, there are several pages containing the usual information generally contained in diaries, and one page on which is given a list of the manufactures of the firm.

The Southern Counties Federation of Building Trades Employers, London, have issued a Diary and Year Book for 1924, containing a £1,000 Insurance Coupon.

From Messrs. Frank S. Mayo, 11, Queen Victoria-street, London, we have received a useful Daily Pad for 1924. From Messrs. Jenson & Nicholson, Ltd., Stratford, and Messrs. Young & Co., Westminster, we have received calendars respectively.

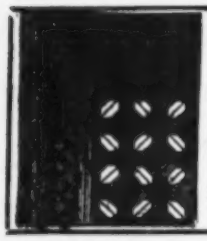
Messrs. N. Gerver, 204-206, Bethnal Green-road, London, inform us that on receipt of a trade card they will be pleased to send, post free, a calendar for the year 1924.

We have received calendars for 1924 from the following: Messrs. Lewis E. Nunn; The Ironite Co., Ltd.; The Ragusa Asphalte Paving Co., Ltd.; Mr. G. H. Carter; Joseph Freeman, Sons & Co., Ltd.; and Mr. Edward B. Holmes.

One of the handiest little diaries we have seen is that issued by the "Woco" Door Co., which is well arranged and serviceable in style and production. Incidentally, it will be none the worse for reminding us of the progress we are making in useful building materials.

We have received useful calendars from Messrs. Joseph Westwood & Co., Ltd., and W. H. Willcox & Co., Ltd. From The Ringmer Building Works a number of blotting pads; and from Kelly's Directories, Ltd., the Post Office London Directory for 1924.

The will has been proved of Mr. Alfred James Higley, of Herne Lodge, Severn-road, Weston-super-Mare, Somerset, retired builder—net personalty, £3,224; gross, £7,152.



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